

THE IRON AGE

New York, August 28, 1919

ESTABLISHED 1855

VOL. 104: No. 9

France Must Export Half Her Steel Output

Interest for American Exporters and Economists in the Efforts to Secure Low Costs Thus to Market Her Increased Capacity

— BY JOSEPH F. SHADGEN* —

THE war has proved to every country the vital importance of the iron and steel industry from the economic as well as strategic standpoint. Steel is the real heart of the national defense. The efforts of every government are logically concentrated on securing a sound future within its boundaries for that basic industry.

France in particular learned that bitter lesson because the German aggression was willfully directed against the French iron ore mines, the blast furnace plants in Lorraine and steel mills in the north. The speedy occupation of 194 was followed by the wanton destruction and systematic dismantling and crippling of 1917 and 1918.

No wonder that France attacks with firm determination the after-war problem of putting her national iron and steel industry on a sound and strong foundation with due consideration to her whole economic welfare.

The "Comité des Maitres des Forges de France" (Association of French Iron Masters), in connection with the *Revue de Metallurgie*, has published several booklets and reports and suggestions on the reorganization of the after-war production of iron and steel products. A condensed abstract of these studies may be welcomed by the readers of THE IRON AGE because the conclusions arrived at are interesting and partly apply to American conditions.

The economic facts governing the steel trade in France may be summarized as follows:

1. *Coal.* In spite of the return of Alsace-Lorraine to the mother country and the economic control of the Saar region, France produces only two-thirds of its yearly needs in fuel. This poverty in an essential is rendered more acute by the desolate conditions of the coal mines in the north which suffered so much from devastation and whose productivity will be crippled until 1925. Taking the 1913 statistics as a basis, France will have an annual shortage of 24,500,000 metric tons of coal, as her consumption of 82,500,000 tons exceeds the production by that amount.

2. *Coke.*—The conditions of the coke industry are still worse on account of the natural scarcity of coals suitable for coking. The yearly production of about 5,000,000 tons leaves a deficit of about 7,000,000 tons, which has to be imported to supply the needs of the blast furnaces and foundries, at high cost and long haul transportation charges.

3. *Iron Ore.*—France, on the other hand, is blessed by an abundance of iron ore obtainable at low cost and with an immense reserve in the mines. The recovery of Lorraine brings the yearly production up to 41,500,000 tons. The existing blast furnaces of the country do not absorb more than 30,000,000 tons so that about 11,500,000 tons are available for export to neighboring states.

4. *Calcareous Products and Dolomite.*—The north of France is well dotted with calcareous stones at easy transportation distance from the furnaces. Unfortunately the burning of limestone and the roasting of dolomite requires fuel, special coals expensive in France. Thus in spite of a natural abundance of raw material, about 70 per cent of these products are imported because the Belgians produced at lower cost.

5. *Pig Iron.*—The annual capacity of the French blast furnaces will be about 10,500,000 metric tons, or considerably more than the country can absorb. The cost of production is handicapped by the scarcity of coke, but of course is favored by the low price of ore.

6. *Manganese Alloys.*—Absence of natural manganese ores and shortage and high price of coke prevented the development of spiegeleisen and ferromanganese manufacture, so that practically all of the needs of France were imported from England or Germany. In 1912-13 an attempt was made to render the country partly independent by the building of a special blast furnace plant at Rouen (close to the seashore). National consideration seemed to have outweighed the high cost of production.

7. *Aluminum.*—The aluminum industry is very prosperous in France because the best and finest bauxite is mined in Provence and cheap water power is available in the nearby Alps. France produced in 1913 over 13,500 tons of aluminum and exported over one-third of its production. Unfortunately the metallurgy of that metal requires 10 to 15 lb. of coal per lb. of aluminum, a condition that is of great importance in a country short of fuel.

8. *Steel.*—The new France will be able to produce yearly about 9,600,000 tons of steel ingots by both the basic Bessemer (Thomas) and open-hearth processes. The country's own needs scarcely amount to 5,000,000 so that over 4,600,000 tons will have to be exported.

9. *Water Power.*—France has an enormous wealth in its "white coal" in the Alps, in the Pyrenees and the "massif du centre." Recent estimates

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show that about 9,000,000 hp. could be utilized, of which about 10 per cent is harnessed to-day. Here lies perhaps the solving of France's fuel shortage. Unfortunately hydraulic power plants, costly to install and slow to build, are located far away from actual industrial districts so that they are at present of little importance to the iron industry.

Why Low Cost Production Is Essential

The above statistical facts show that France's necessity is the exportation of iron and steel products, because plants are in existence, labor is waiting for work and national resources must be utilized to recover from the wounds of the war. This necessity is imperative because the home market can never absorb the surplus, and, furthermore, the exportation must be permanent.

What are the conditions actually confronting the iron and steel trade in France? A country that before the war had no export trade to speak of is confronted with the task of selling 40 to 50 per cent of its iron and steel production abroad. The only solid and sound foundation to that end is production at low cost because all artificialities of government protection tariffs lead to controversies, retaliations, and the dumping policy proved to be a boomerang in the long run.

An analysis of the costs of production shows that they are made up of a number of items that can be classified under the following heads: *a*—raw materials; *b*—labor; *c*—manufacturing costs; *d*—overhead charges. The vitality of the French iron and steel industry depends on the reduction of each of these factors to the ultimate minimum.

Raw Materials.—Ore is abundant, over-abundant, but coal is scarce and very high in price, far away from the mines. The cost of these basic products varies little and is beyond control of the metallurgist, as freight rates and national policies influence greatly their market prices.

Labor.—Labor will be scarce in France because the toll of war was high, very high. Labor-saving devices will be the only way to meet that difficulty; mechanical devices and electricity must be used to a greater extent, just as in the American plant. The importance of manual skill will diminish but its influence will last because fewer but higher-priced men will have to be relied upon.

Overhead Charges.—The overhead charges are made up of various items, like interest on working capital and on stocks of raw material, writing off of plants and buildings. The general organization charges can hardly be changed because exportation means long-term credits and complicated staffs of experts.

Manufacturing Costs.—The only item subject to radical reductions are the manufacturing costs proper, made up of the tools and the organization of the steel plants and the whole industry. Three means of reducing the manufacturing cost are recommended by the French experts.

Ways of Reducing Manufacturing Costs

1. The standardization of the shapes.
2. The specialization of the plants.
3. The creation of a sole selling comptoir.

It is unnecessary to explain to Americans the advantage of standardization, because this idea has been developed here to such an extent that it has become part of the whole American industrial organization. The American steel industry was the first to recognize the full advantages of the standardization of all rolled products. In the matter of rails, for example, an American has an A. S. C. E. standard while in France of six railroad companies

three have Vignole rails and three have double-head rails. That standardization reduces manufacturing cost is so evident that it is strange to understand why it has to be recommended to be adopted. The fact that about 14 steel plants have to be rebuilt ought to help the speedy adoption of standardization in France.

The specialization of the various steel plants carries the idea of standardization further and adds to it the advantages of concentration. The various companies ought to specialize each in some line of products, rails or beams and shapes, plates or sheets, etc. The reorganization of the national industry and reconstruction of the destroyed plants give to the French iron masters a splendid opportunity to carry out this second recommendation as important as the first one on the ultimate cost of production.

Commercial understanding by organization of a sole sales syndicate for all iron and steel products is the third recommendation of the French economists to reduce manufacturing costs. A national co-operative comptoir binding all producers for long terms through mutual agreements will inspire confidence through just settlement of claims and profits and equalize all local advantages and all personal points of view for the common interest of all concerned and thus for the development of the whole industry and the national welfare.

The utility of such a sales organization cannot be contested from either the standpoint of the producer or that of the consumer, because it would inevitably act as a regulator and protect the one against excessive prices and the other against unjust slumps. It would, above all, render possible the full development of the second recommendation: specialization of plants. It would permit a logical development of the whole industry, and it would cut out waste and double transportation. It would, in a word, favor national efficiency.

The necessity of such an organization seems imperative in the light of the difficulties of readjustments, of the risks of the vast program of reconstruction and of the larger percentage of the surplus production that has to be exported. In spite of these accepted advantages the difficulties of creating a national sales syndicate are manifold, because many varied industries have to be welded together and much prejudice has to be overcome. State coercion will be necessary and distrust of legislation has to be overcome before success by this road is certain.

The outcome of these plans to organize efficiently the French iron and steel industry for the after-war production will not only prove interesting to the economist but concern vitally the American exporter.

The Swedish iron ore exports during the first four months of the current year amounted to 367,000 tons only, as against 1,061,000 tons during the same four months in 1917. A German commercial paper paints a sombre picture of the present position of the Swedish iron and steel industry. Costs of output are very high, competition of foreign manufacturers is acute, prices are too low, and show signs of weakening, and stocks are accumulating as orders are few. In some parts of Sweden the working hours per week had to be reduced by 10 on an average for want of work. If the blast furnaces have to reduce or to stop work altogether, mining operations will also have to slacken or to cease. According to the quarterly report of the Swedish Ironworks Association, of the 132 existing furnaces, only 81 were in blast on April 1. The iron mines in the North, however, are still in full working order. The introduction of an eight-hour working day will not improve matters.

Europe's Social and Financial Instability

Unfavorable Effects of Victory on France's Industrial Efforts—Initiation of American Advertising Campaigns Abroad Recommended

RETURNING from a short business trip to France last month, Samuel S. Buckley, president Onondaga Steel Co., Syracuse, N. Y., has made some observations that may be of interest to American business men seeking first-hand information as to business conditions in France and other European countries. His study of the present economic situation in France applies particularly to present-day wage and labor conditions in the iron and steel industry, to the attitude of the returning soldier toward work and the national 8-hr. day, the high rate of wages now being paid, the lack of fuel and the consequent high price of coal and particularly to the matter of foreign exchange as affected by imports and exports.

Wages

"As a manufacturer, I was deeply interested in the prevailing wage rates in France, more particularly in the steel, iron and building trades. In these lines the wages run practically the same as are being paid in this country, that is, figuring the then prevailing exchange rate, which gave the franc a value of 16c. The rates as given me are as follows: Common labor from 38c. to 45c. an hour, skilled labor, such as machinists and toolmakers, from 45c. to 60c. an hour; skilled labor in the steel mills from 55c. to 85c. an hour, highly skilled labor at the rate of \$40 to \$60 a week, masons and carpenters from 70c. to 85c. an hour.

"Here a condition is noted similar to that prevailing in this country, the unskilled rate is very close to the medium skilled labor rate or that of machinists, toolmakers, etc.

"I was told by observers who had gone into England that the rates in the steel mills there were not quite, but very nearly, those paid in France. I would judge about 15 per cent less, and have information from reliable source that labor throughout the Scandinavian countries has advanced 400 per cent since 1914.

"A big element in the cost situation in France and other European countries is the high cost of fuel, coal costing \$20 per ton in France at the then prevailing rate of exchange, and much higher in Italy. I was given figures from \$40 to \$60 per ton for the last named country, and from reliable information a figure of between \$26 and \$27 per ton in the Scandinavian countries.

"It is a well-known fact and one that has been stated recently by Lloyd George and at least two other leading English statesmen that coal can be mined in West Virginia, shipped by rail to the seaboard and by boat at the present high ocean freight rates to Newcastle and delivered on the dock in that city for less money than a Newcastle miner can take his coal out of the ground.

"These facts on the face of them would lead one to believe that the obvious market for American manufactured goods would be Europe. You will note by report on exports for June that we shipped over \$918,000,000 worth of goods out of this country during that month. This statement, coupled with the fact that the rate of exchange as reported July

30 shows franc checks at 7.22, lire checks at 8.57, mark cables at 6¼ and Vienna cables at 27/8.

Foreign Exchange and European Embargoes

"The reason for this recent drop in exchange with the countries referred to you can readily see is the enormous amount of imports they have received, and largely from this country.

"The French financiers realizing the disadvantage they would be put to in the lowering of the exchange, recommended embargoes on imports, trying by that means to force their people to a greater concentration of effort toward recuperating themselves and furnishing as much as possible their own requirements. This embargo, like any other artificial means, did not prove to be at all satisfactory, giving way largely, I think, to the argument that France must have raw material and the finished product, such as machines, to enable her to get the people to work and get them in position to supply their own needs. Thus the embargo was removed, but accompanied by a not very heavy increase in import tariff.

"I have known from time to time of the efforts that some of the American bankers have made toward correcting the exchange situation, but I do not think any concerted effort has been put forth. In searching for a means to correct the exchange situation we must look back to the condition of the French people, and consider whether or not they are going to be in shape within a reasonable time to get into production. It has been a well-known fact for years past that the French workman would produce only about one-half as much per-hour-work as the American workman. This in some lines has been corrected through the pressure brought to bear in the production of munitions and war supplies; but this correction only applied to those not taken into the army, i. e., the men of 50 years and over, from 17 years and under, and women, also a few especially expert men released from service, and a few of the wounded who had recovered but not sufficiently for further service.

Mental Rehabilitation of Ex-Fighters

"The bulk of the productive manhood was in the service and did not get the benefit of the discipline and the training essential in high-rate production. With the productive manhood serving an average of between two and two and a half years in the army, with the habits developed by that service, love for the open, or camp life, loss of initiative and disregard for personal responsibility, highly developed, we wonder if it will not take a considerable length of time to get these men back into even the old-time production, let alone the high-rate production to which others of their countrymen have become accustomed.

"Business men who went through the period immediately following our Civil War found the same difficulty in getting the boys back into industrial life, in fact, one great result of the Civil War was the 'American tramp' or 'hobo,' still with us as a reminder of that conflict.

"A friend of mine in Paris, a large employer of labor in banking and transportation business, informed me that he had been thoroughly discouraged in his efforts toward finding positions for returned soldiers, because of the characteristics as above described.

Injurious Psychology of Victory

"Then, too, there is the psychology of the victor to be considered in the matter of the French as a nation as well as with the other Allies. They are, as a friend has expressed it, 'sitting back and polishing up their medals.'

"On top of all this, the Government, forced by the Labor Party, passed a national 8-hr. law, which under ordinary circumstances might be considered a wise thing to do, but under present circumstances probably very unwise.

"Compared with the above we will take the Germans with their demonstration of the psychology of defeat, working hard, producing per man as much as we have ever produced here, having an 8-hr. law, but with a proviso enabling the Government to subsidize the workmen on overtime.

Germany Back at Work

"One obvious though startling suggestion presents itself here. That of Germany with her plants unimpaired except due to shortage of some materials, a shortage that can be quickly corrected, with a concerted effort on the part of her manufacturers to make a quick recovery, her people working hard and producing as never before, with exchange practically on par with other European countries outside of England. Will we not find in her a menace to our future trade, and is not this condition the greatest argument that could be put forth to induce our financial men to do everything in their power to correct the exchange rate?

"This correction can also be accomplished if France and other countries showing low exchange rates would cease buying or get into larger production and larger exports. In short, the more thought I give this problem the more I am inclined to believe that we should not send salesmen to force the sale of goods to those countries in Europe that are at a

decided disadvantage on account of the condition of exchange. To such countries I think we should sell only the things they actually need, and that we should buy from them everything they can possibly ship to us.

"As to marketing our excess products, particularly manufactured goods, our big effort should be addressed to the countries not so heavily affected by the war and by the exchange rate, notably those countries in Europe showing less depreciation in exchange, such as Great Britain, Sweden, Norway, Denmark and Spain, all showing a light reduction in exchange as compared with the foregoing countries and the South American, African and Asiatic markets.

Question of Waiving American Tariffs

"This leads up to the tariff question. Until the matter of foreign exchange is corrected I think there should be special arrangements made to permit imports of those products for which the low exchange rate countries are best fitted to furnish us.

"This is the time to handle the tariff problem as a special question in a special way to meet the unusual conditions now prevailing, and it should only be treated as it has been in the past—we might say on its merits—when the various countries should have reached par in their financial arrangements.

Advertise America Now

"I am afraid that what I have said may seem rather discouraging to your project to encourage American exports. I do not think this is the time to lay down on the advertising of American goods. While the situation seems very bad in the matter of exchange in some countries, there are enough other countries that are not at so great a disadvantage but that it would pay us to make every effort to market our goods with them.

"While the exchange condition looks black at the present moment, I think that it will be corrected in the not distant future, thus an advertising campaign anticipating results, say not within a year in those countries showing unfavorable exchange rates, would in all probability be money well invested."

American and British Pig Iron in Sweden

A petition from about 20 Swedish pig-iron producers has been presented to the Swedish Government asking it to uphold the existing import regulations as to pig iron, says a German paper, quoted in the *London Iron and Coal Trades Review*. If this cannot be done the petition asks for a stipulation that foundry pig irons be imported only on condition that the country supplying them undertake to buy an equivalent quantity of Swedish iron.

The memorialists justify their request by a reference to the difficulties in disposing of Swedish pig iron, especially in Great Britain, hitherto pre-eminently the market for these products. The falling off of the British market is felt all the more as inquiries for pig iron in Sweden itself have considerably declined. Besides this, cheaper kinds have found their way into the country, more especially British and American makes, which are threatening to displace Swedish foundry pig altogether. The increase in the costs of charcoal, labor, iron ores and transport have so much enhanced the cost of production that charcoal pig iron can no longer be made without loss if it has to be sold at the maximum prices now in force.

The memorial concludes by stating that the Swedish iron works are unable to compete with Great Britain and America, and that unless something is done to protect them they will be obliged to stop production. The

comment of the German paper on this is that, as a matter of fact, there is at present no special protective duty on imported pig iron, and that foundry pig iron finds its way into Sweden "by the usual channels and under terms provided for in agreements entered into between the contracting countries," the permits for import being hedged round by numerous provisions and only obtainable with difficulty.

Construction operations will commence at an early date on a plant for the manufacture of double disc automobile wheels by the Reliance Wheel Co., Youngstown, Ohio, capitalized at \$100,000. The wheel is made of two discs of hydraulically pressed steel, the discs and rim being pressed out of one piece of steel. It is claimed the product is as light as the ordinary wooden wheel and much stronger. The wheels are adapted to airplanes and tractors. Joseph M. Crenan is president of the company and H. H. Hull secretary.

The largest all-water route shipment of power steel wire from overseas for St. Louis since the beginning of the war has arrived via the Federal barge line. The shipment was consigned to the Broderick & Bascom Rope Co., St. Louis. It exceeds a maximum freight carload. The shipment originated at Liverpool, England, and arrived at New Orleans via the S. S. *Historian*.

Pipe Flange Thread Milling Machine

A thread miller with attachments to adapt it to milling threads on pipe flanges is a recent product of the Smalley General Co., Bay City, Mich. It is known as the company's No. 1 model, and has a capacity up to 16 in. inside diameter threads with 3 in. diameter hobs.

The general principle which applies to all the company's thread millers applies to this one: That is, during milling, while the work held in the chuck makes one revolution, the milling head is moved back on the ways of the machine a distance amounting to the pitch of the thread to be milled, and, when a multiple tooth hob is used, the thread is completed at one revolution of the work.

In order to give the hob the proper travel to produce a taper thread a very heavy and rigid taper attachment is provided. It is emphasized that in thread milling the operation is not to bore out the flanges but to mill the thread from the rough. This means that not only a roughing cut but a finishing cut as well is taken across the whole width of the threaded surface instead of one thread at a time, as in a lathe.

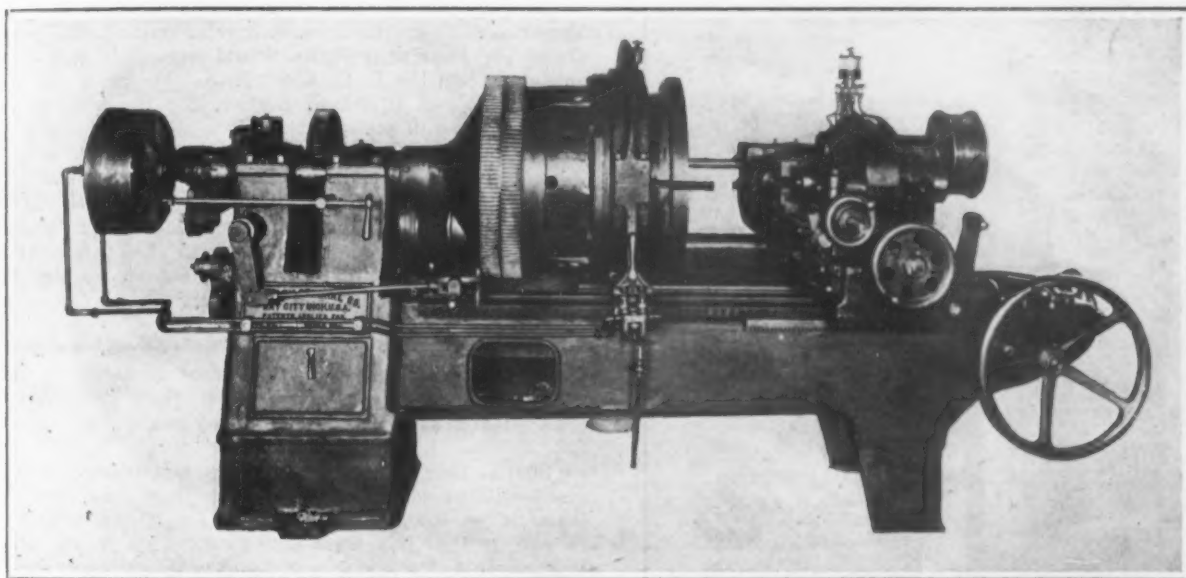
It is equipped with an air operated chuck when the customer can supply compressed air to run it. Only

This spindle is back-geared in ratio of 3 to 1 to the pulley shaft. The machine is equipped with a pump which forces the cutting fluid from a tank in the base through a flexible pipe to the hob.

Revised Ocean Freight Rates

WASHINGTON, Aug. 25.—Revised ocean rates from North Atlantic to European and also to Far Eastern ports have been issued by the Shipping Board. In the case of the rates to European ports iron and steel articles are listed as special and subject to negotiation, dependent upon the condition of the market and the need of heavy cargo.

Rates on iron and steel articles, which formerly were quoted by the ton, are now in effect from North Atlantic ports to French Indo-China, the Federated Malay States and the Dutch East Indies on a 100-lb. and cu.-ft. basis, ship's option. The rates are 90c. per 100 lb. or 50c. per cu. ft., applying to the following articles: Band iron, shop iron, bars, billets, beams, blooms, pig iron, plates, flat structural, barb wire, plain wire, galvanized wire, wire shorts, trolley poles, boiler tubes, bridge material, spelter, lead, car wheels, ties, angles, channels, bolts and nuts, ingots, rods, sheets, slabs, rails



A Massive Type of Pipe Flange Thread Milling Machine Designed to Eliminate Chatter and Wear on Parts and Bearings

a few seconds are therefore necessary to chuck or remove the work from the machine. Chucks are equipped with false jaws to adapt them to various sizes of flanges. They are so arranged that they will take any size flange up to 23½ in. outside diameter. These chucks are of sturdy construction and their upkeep is negligible.

The chuck body is threaded onto the main spindle, as in a lathe, and on the front is placed a staggered tooth gear of broad face. This delivers the power to the chuck right at the point where it is required. It is claimed to give a powerful and steady drive free from vibration. The drive shaft carrying the pinion is driven through a worm gear by another shaft having a three-step cone, giving three speeds from the countershaft. If a two-speed countershaft is used six speeds will be possible.

The machine is provided with a power feed facing attachment which is driven from the main spindle giving three feeds of 1 to 16, 1 to 8 and 3 to 16 ratio. The attachment is so arranged that it can be reversed and it is provided with trips so as to throw out the feed when the tool has traversed the proper distance. The different feeds are obtained by a shifting gear after the style of a change gear box. This device like the rest of the machine is of heavy type. The cutting speed of the flanges runs about 50 ft. per min.

It is claimed that the heavy head eliminates chatter and it is pointed out that the extra heavy milling spindle gives long life to that part and the bearings.

and accessories, staples, shafting, tin plate, horse shoes, nails, concrete reinforcement, castings, axles.

The same rates apply to Japan, China and the Philippine Islands.

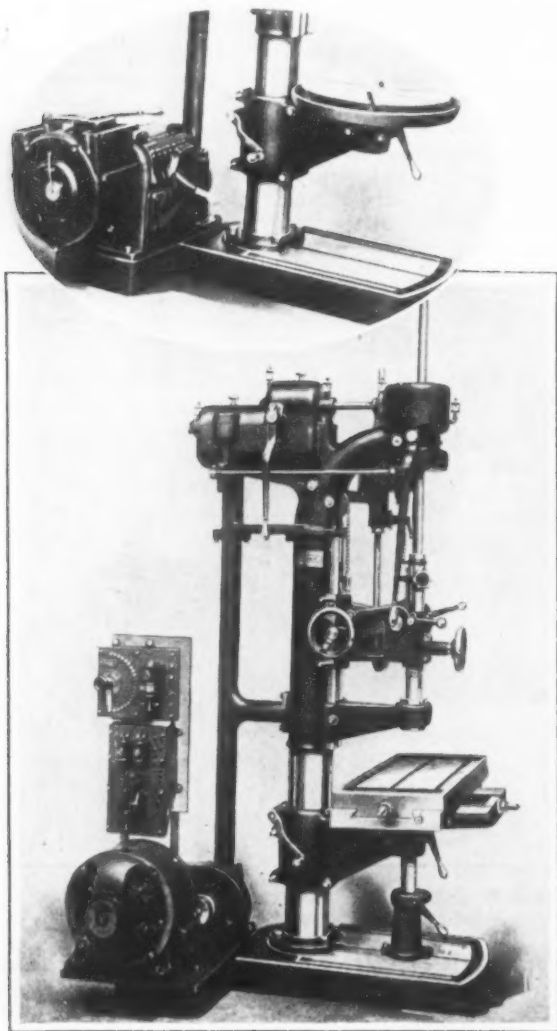
A new tariff on commodity rates from United States Pacific Coast ports to Japan, China and the Philippines quotes 60c. per 100 lb. as the rate on iron and steel articles, viz.: band iron, bars, billets, blooms, bolts, hoops, ingots, pig iron, plates (including boiler plates bent), rails not exceeding 33 feet in length, and fastenings, rods, sheets, slabs, structural steel not fabricated.

Within the past year St. Louis has acquired a new industrial district, housing 37 industries, with more than 14,000 employees, and involving an expenditure of \$20,000,000 for new plants. The tract of land upon which these new plants will be built is about one mile square and was absolutely undeveloped property. The first company to select a site for a plant was the General Motors Co., Detroit. Work on the plant has been started and it is estimated that the total cost will be \$10,000,000. It will be opened about Jan. 1, 1920. Other companies building or about to build plants there are Pullman Co., Bridge & Beach Stove Co., General Electric Co., Garrett & Co., Killark Electric Mfg. Co., Monarch Metal Weatherstrip Co., St. Louis Metal Ware Co., Inland Machine Co., Mesker Bros. Iron Co., Wrought Iron Range Co., Lincoln Forge Co., J. C. Bulls Mfg. Co., and Union Sand & Material Co.

New Heavy Duty Upright Drill

An upright drilling and tapping machine of new design is announced by the Fosdick Machine Tool Co., Cincinnati. The gearing arrangements, frictions, feeds and quick return are similar in detail to the corresponding parts which are being successfully used on the company's heavy duty radial drills.

The base is surrounded by a channel draining to a large reservoir for drilling compound, and is so designed that bolts may be entered from either end of the T slots. The table arm has long bearing on the column and is internally ribbed similar to a bridge or roof truss, so as to increase the rigidity. The table is raised and



Fosdick's Upright Drilling and Tapping Machine, Which Has Gearing Arrangements, Frictions, Feeds and Quick Return Similar to the Company's Heavy Duty Radial Drills. The drill range is from 3/16 in. carbon to 2 1/2 in. high speed, with slow speeds for heavy tapping and boring up to 5 in. in diameter. Drive is by belt or motor.

lowered from either side of the machine and may be swung around the column to clear the base for large work and cannot accidentally drop when unclamped. It is pointed out that the arrangement of the table T slots allows them to terminate very close to the center, allows heavy ribs to run directly toward the hub, permits work of any shape to be securely clamped and prevents bolts from flying out should they become loosened while drilling.

The spindle head is raised and lowered by a hand-wheel, and not being burdened with the heavy feed arrangement, is well counterbalanced. The spindle is provided with depth gage and automatic trip which may be set to graduations in any position in the entire length of travel. A safety trip is provided at the limit of traverse to prevent accidents. The spindle return acts quickly, requires but one hand to operate for sensitive drilling, for tapping, for rapid lowering or return of the spindle, and with or without disengaging the power feed or the hand wheel feed.

The power feeds are all obtained by a single lever, within reach of the operator while seated, although it has been placed high enough not to interfere with the operating levers on the head. The hand feed may be fed ahead of the power feed without disengaging the latter, an advantage in starting large drills. The friction reverse tapping mechanism is placed between the initial drive and the backgears. This construction is pointed out as making the power transmitted to the spindle greater than in the spindle friction type.

Ball bearings take the principal thrusts including the spindle, both crown gears, the vertical driving shaft and friction bevel pinion, the feed worm and feed bevel gear. A metal chart showing speeds and feeds for high speed work is attached to the machine. Drive is by a belt through a gear box or by constant or variable speed motor. A compound table, tilting or square table is supplied.

Tests of a New Electric Process for Smelting Iron Ores

A test of considerable interest is now being made to prove the commercial possibilities of smelting magnetite ore in British Columbia, according to *Iron and Steel of Canada*, which has the following:

On July 9 J. H. Fraser, managing director for the Vancouver Magnetite Iron & Steel Smelting Co., owners of the Ronaldsay Howe Sound iron smelting plant, obtained from the B. C. Electric Co. the use of the old power plant at Highland Station for the purpose of carrying out full tests of the Fleet process of smelting magnetite. The Provincial Government is doing everything possible to encourage the development of the iron industry in British Columbia and has granted \$2,000 to carry out the test and has shipped 50 tons of Texada Island ore to be used. In addition to this the government has agreed to pay a bonus of \$3 a ton for all iron smelted in British Columbia from British Columbia properties.

Mr. Fleet declares that by his process, which is electrical, he can produce pig iron at from \$11 to \$13 a ton, this being considerably less than the oil and coke method used at the Ronaldsay plant which costs \$22.

Should the Fleet process prove satisfactory a full plant will be erected and the pig iron then handled through the Ronaldsay smelter where it can be transformed by the oil process into steel. This would place Vancouver on better than a level with iron and metal industries of the East and will help to continue on the Pacific Coast the industry of steel shipbuilding.

W. D. Fleet of Montreal, the inventor of the process, was superintendent of the Canadian Copper Smelting Co. at Sudbury for six years, and later installed the electrical apparatus in the big hydro-electrical plant of the Calgary Power Co. at Kananaskis and Horse-shoe Falls. His process, which is now being tested on the iron ores of British Columbia, took three years of experiment and study, and is declared by men who understand smelting to be a successful one.

The German Machine Tool Industry

The difficult position of the German machine-tool industry was demonstrated by statistics of production laid before the recent meeting of the Association of German Machine Tool Manufacturers. In 1914 the selling value of the products of the industry was 950 million marks, and in 1917, as a result of the war demand, it rose to 1,700 million marks. By fully utilizing its plant and with an ample supply of raw materials the industry could, at present prices, turn out from 2,000 to 3,000 million marks' worth of machines yearly. The transfer to peace work has only been carried out in part so far. The sales in the home market are small at present, but the market is showing signs of revival. Export business is increasing, and it is reported that most foreign buyers are anxious to resume their former relations. The dissatisfaction among the workmen, however, is weighing heavily upon the industry, and unless they abate their claims it will be impossible to produce machine tools profitably.

Mechanical Properties of Steel and Iron

Compilation Made Public by the
Bureau of Standards to Secure
Criticism for Purposes of Revision

WASHINGTON, Aug. 26.—The Bureau of Standards has issued a compilation of mechanical properties of materials. The document is intended to give the various factors in a long series of materials. A table covering the iron and steel industries with a long list of alloys has been worked out with care. The table as issued is still subject to revision but is being made public for the purpose of securing the widest possible criticism and comment on the factors shown.

"The ultimate strength and other properties of materials," says the introduction, to the table, "vary between wide limits and the following figures are given as being representative rather than what may be expected from an individual sample. Data on mechanical properties may be given either in the form of specification or ex-

of the specimen, (or the corresponding stress in the extreme fiber as computed from the flexure formula for transverse tests).

The definitions follow:

1. Proportional limit (abbreviated P-limit).—Stress at which the deformation (or deflection) ceases to be proportional to the load,—(determined with extensometer for tension, compressometer for compression and deflectometer for transverse tests. Value read from plotted results).

2. Elastic limit.—In tensile and compressive tests: The stress at which the initial permanent elongation (or shortening) of the gage length occurs, as shown by an instrument of high precision,—(determined from set readings with extensometer or compressometer). In transverse tests: The extreme fiber stress at which the initial appreciable perma-

IRON AND IRON ALLOYS

	Tension, lb. per sq. in.		Per Cent		Hardness	
	Yield Point	Ultimate Strength	Elongation in 2 in.	Reduction of Area	Brinell at 3000 kg. 95*	Sclero- scope 18
Iron, Electrolytic (Remelt):						
as forged	48,500	55,000	33.0	83.0		
annealed, 900 deg. C.	18,000	38,000	52.0	87.0		
Note: Properties of Swedish iron (impurities less than 1 per cent approximate those of electrolytic iron.						
*These two values of B.h.n. only are as determined at 500 kg. pressure.						
Gray cast		25,000		negligible	100	24
(19 mm. diameter bars)		38,000			150	40
(U. S. Navy Dept. 4912a specified minimum tensile strength of 20,000 lb.)						
Malleable cast, American	20,000	35,000	15	15		
(after Hatfield)	45,000	57,000	4½	4½		
European	27,000	42,000	6	6		
(after Am. Malleable Castings Assn.—run of 24 successive heats).	40,000	65,000	2	2		
Commercial wrought	28,000	48,000	21.6	45.0		25
	32,000	53,000	40.0	35.0		39
(Dash prefixed indicates upper limit of range.)						
Silicon alloys, Si., 0.01:						
as forged	41,800	45,200	25.0	78.0		
(Melted in vacuo.) ann.						
970 deg. C.	16,000	34,900	53.0	81.5		
(Note: C max., 0.01 per cent.)						
Si., 1.71: as forged	68,100	76,300	37.0	82.0		
annealed 970 deg. C.	35,800	54,200	50.0	90.6		
Si., 4.40: as forged	94,000	105,000	6.0	7.5		
annealed 970 deg. C.	72,900	91,600	24.0	25.1		
Note: From T. D. Yensen, Univ. of Ill., Engr. Exp. Station, Bulletin No. 83, 1915 (shows Si. 4.40 as alloy of maximum strength).						
Aluminum alloys, Al. 0.00:						
as forged	50,700	54,700	26.0	84.3		
(Melted in vacuo.) ann.						
1000 deg. C.	17,600	34,900	60.0	93.5		
(Note: C max., 0.01 per cent.)						
Al. 3.08: as forged	68,200	77,500	21.0	76.4		
annealed 1000 deg. C.	31,800	53,400	51.0	85.3		
Al. 6.24: as forged	77,700	86,000	28.0	74.7		
annealed 1000 deg. C.	53,400	69,800	27.0	55.5		
Note: From T. D. Yensen, Univ. of Ill., Engr. Exp. Station, Bulletin No. 95, 1917.						

perimental values. Unless otherwise shown, the values below are experimental.

"In general test specimens used in the determination of the tabulated data were in conformity with the recommendations of the American Society for Testing Materials. In general tensile specimens were 12.8 mm. (0.505 in.) diameter and 50.8 mm. (2 in.) gage length. Sizes of compressive and transverse specimens are generally shown accompanying the data.

"All data shown in these tables are as determined at ordinary room temperature, averaging 20 deg. C. (68 deg. F.) The properties of most metals vary considerably from the values shown when the tests were conducted at higher or lower temperatures."

The document also gives a series of definitions to govern the more commonly confused terms for properties determined from mechanical tests of materials shown in tables. In all cases the stress referred to in the definitions is equal to the total load at that stage of the test divided by the original cross-sectional area

ment deflection occurs,—(determined with deflectometer but rarely determined).

3. Yield point.—Stress at which marked increase in deformation (or deflection) of specimen occurs without increase in load,—(determined usually by drop of beam or with dividers for tension, compression or transverse tests. Reported for all tests of ductile materials).

4. Ultimate strength in tension or compression.—Maximum stress developed in the material during test.

5. Modulus of rupture.—Maximum stress in the extreme fiber of a beam tested to rupture, as computed by the empirical application of the flexure formula to stresses above the transverse proportional limit.

6. Modulus of elasticity.—(Young's modulus)—Ratio of stress within the proportional limit to the corresponding strain,—as determined with a precise extensometer. Note: All moduli shown are obtained from tensile tests of materials, unless otherwise stated. Accurate determinations of the modulus of elasticity are made with a gage length at least 8 in. in length.

7. Brinell hardness numeral (abbreviated B. h. n.)—Ratio of pressure on a sphere used to indent the material to be

CHEMICAL ANALYSES AND MECHANICAL PROPERTIES OF CARBON STEELS

Metallurgical Branch of Engineering Division, Motor Transport Corps, Table 90, 1918.

Heat treatment: Specimens were heated to temperatures varying from about 875 deg. C. (1607 deg. F.) for the low carbon steels to 800 deg. C. (1472 deg. F.) for steels with the higher carbon contents and quenched in water. They were not drawn subsequently. Columns headed "Annealed" show data for material as forged.

Approx. Analyses						Tension								Hardness	
						Annealed				Heat Treated				Heat Treated	
C	Mn	Si	P max.	S max.		P-limit	Ultimate Strength	Elonga- tion in 2 in. of Area	Reduc- tion of Area	P-limit	Ultimate Strength	Elonga- tion in 2 in. of Area	Reduc- tion of Area	Brinell at 3000 kg.	Sclero- scope
0.05	0.65	0.16	0.045	0.045		29,500	42,800	37	63	31,400	44,800	23	67	165	25
0.06	0.65	0.16	0.045	0.045		30,000	43,500	36	62	32,100	45,800	22	66	178	27
0.07	0.65	0.16	0.045	0.045		30,400	44,125	36	62	33,600	47,600	22	66	191	29
0.08	0.65	0.16	0.045	0.045		30,750	44,700	35	61	34,800	49,300	22	65	204	31
0.09	0.65	0.16	0.045	0.045		31,200	45,300	35	61	35,400	51,200	21	65	218	33
0.10	0.65	0.16	0.045	0.045		31,600	46,000	35	60	36,600	53,000	21	64	230	35
0.11	0.65	0.16	0.045	0.045		32,100	46,600	34	59	37,200	54,800	21	63	237	36
0.12	0.65	0.16	0.045	0.045		32,600	47,300	34	59	39,800	56,600	20	62	250	38
0.13	0.65	0.16	0.045	0.045		33,000	47,800	33	58	40,800	58,300	20	62	257	39
0.14	0.65	0.16	0.045	0.045		33,500	48,600	33	57	42,000	60,200	20	61	270	41
0.15	0.65	0.16	0.045	0.045		33,900	49,200	32	57	43,400	61,900	20	60	277	42
0.16	0.65	0.16	0.045	0.045		34,300	49,900	32	56	44,600	63,800	19	59	290	44
0.17	0.65	0.16	0.045	0.045		34,600	50,500	32	55	46,000	65,600	19	58	296	45
0.18	0.65	0.16	0.045	0.045		35,100	51,200	31	55	47,200	67,400	19	57	310	47
0.19	0.65	0.16	0.045	0.045		35,700	51,800	31	54	48,500	69,200	18	55	323	49
0.20	0.65	0.16	0.045	0.045		36,000	52,400	31	53	49,800	71,100	18	54	336	51
0.21	0.65	0.16	0.045	0.045		36,600	53,000	30	52	51,000	72,800	18	52	345	52
0.22	0.65	0.16	0.045	0.045		37,000	53,700	30	51	52,300	74,600	17	51	345	52
0.23	0.65	0.16	0.045	0.045		37,300	54,300	30	50	53,500	76,300	17	49	356	54
0.24	0.65	0.16	0.045	0.045		37,800	54,900	29	50	55,000	78,200	17	48	369	56
0.25	0.65	0.16	0.045	0.045		38,200	55,500	29	49	56,100	80,000	17	47	373	58
0.26	0.65	0.16	0.045	0.045		38,800	56,200	28	48	58,000	81,000	16	46	396	60
0.27	0.65	0.16	0.045	0.045		39,100	56,800	28	47	59,500	83,600	16	44	416	63
0.28	0.65	0.16	0.045	0.045		39,500	57,400	27	46	60,500	85,300	16	43	429	65
0.29	0.65	0.16	0.045	0.045		40,000	58,000	27	46	61,800	87,200	15	42	441	67
0.30	0.65	0.16	0.045	0.045		40,500	58,700	26	45	62,500	89,000	15	42	461	70
0.31	0.65	0.16	0.045	0.045		40,800	59,300	26	45	63,800	90,800	15	42	461	70
0.32	0.65	0.16	0.045	0.045		41,300	59,900	26	44	65,600	92,600	15	40	495	75
0.33	0.65	0.16	0.045	0.045		41,700	60,500	25	44	67,200	94,400	14	39	514	78
0.34	0.65	0.16	0.045	0.045		42,000	61,200	25	43	68,500	96,200	14	38	526	80
0.35	0.65	0.16	0.045	0.045		42,600	61,800	24	42	69,600	98,000	14	38	547	83
0.36	0.65	0.16	0.045	0.045		43,200	62,500	24	42	70,500	99,700	14	37	554	84
0.37	0.65	0.16	0.045	0.045		43,500	63,100	23	41	72,000	101,600	13	36	567	86
0.38	0.65	0.16	0.045	0.045		43,900	63,800	23	41	73,500	103,400	13	36	573	87
0.39	0.65	0.16	0.045	0.045		44,400	64,400	23	40	74,200	104,200	13	35	587	89
0.40	0.65	0.16	0.045	0.045		44,800	65,000	22	40	75,000	105,000	12	35	593	90
0.41	0.65	0.16	0.045	0.045		45,200	65,600	22	40	77,000	108,800	12	34	600	91
0.42	0.65	0.16	0.045	0.045		45,800	66,300	21	39	78,500	111,600	12	34	607	92
0.43	0.65	0.16	0.045	0.045		46,100	66,900	21	39	80,000	112,400	11	33	620	94
0.44	0.65	0.16	0.045	0.045		46,500	67,500	21	38	81,000	114,200	11	33	627	95
0.45	0.65	0.16	0.045	0.045		46,800	68,000	20	38	82,500	116,000	11	33	627	95
0.46	0.65	0.16	0.045	0.045		47,300	68,800	20	38	83,500	117,800	10	32	634	96
0.47	0.65	0.16	0.045	0.045		47,800	69,500	19	37	85,000	119,600	10	32	634	96
0.48	0.65	0.16	0.045	0.045		48,200	70,000	19	37	86,500	121,400	9	31	640	97
0.49	0.65	0.16	0.045	0.045		48,600	70,600	18	36	88,000	123,200	9	31	645	98
0.50	0.65	0.16	0.045	0.045		49,000	71,000	18	36	90,000	125,000	9	30	645	99

The Motor Transport Corps is assembling data for the extension of this table.

CARBON STEEL—COMMERCIAL EXPERIMENTAL VALUES

Metal	S. A. E. Spec. No.	Nominal Contents, Per Cent	S. A. E. Heat Treatment	Tension, lb. per sq. in.		Per Cent		Hardness	
				P-limit	Ultimate Strength	Elongation in 2 in.	Reduction of Area	Brinell at 3000 kg.	Sclero- scope
Steel, Carbon	1010		Ann.	34,500	46,000	37.0	72.0	118	18
	1010		A	39,000	60,000	30.0	62.0	120	24
	1020	Mn 0.45	Ann.	39,500	54,000	32.0	68.0	100	17
	1020		H 230 deg. C	49,500	79,500	20.0	59.0	176	35
	1045	Mn 0.65	Ann.	57,500	71,300	23.0	54.0	168	27
	1045		H 260 deg. C.	88,000	123,000	13.5	36.0	290	45
	1095	Mn 0.35	Ann.	59,500	79,000	21.0	51.0	187	29
	1095		F 510 deg. C.	120,000	175,000	6.0	18.0	551	75

Specification values:

Steel, castings: A. S. T. M. A27-16, Class B, Ann.* P max. 0.06; S max. 0.05.

Grade	Yield Point	lb. per sq. in.	Per Cent	Per Cent
Hard	0.45 ultimate	80,000	15	20
Medium	0.45 ultimate	70,000	18	25
Soft	0.45 ultimate	60,000	22	30

Steel, structural, buildings: A. S. T. M. A9-16; P max.-Bess. 0.10; O.-H. 0.06.

Tensile minimums: Yield point, 0.5 ultimate, or 55,000 to 65,000 lb., with 22 per cent elongation in 2 in. (Values are for rolled mild carbon steel.)

*Average carbon: Castings, C 0.30 to 0.40; structural, C 0.15 to 0.30.

SEMI STEEL

Test results at Bureau of Standards on 155 mm. shell, January, 1919.

Microstructure: Matrix resembling pearlitic steel, imbedded in which are flakes of graphite.

Composition: Comb. C, 0.60-0.76; Mn 0.83; P 0.42-0.43; S 0.077-0.088; Si 1.22-1.23; Graphitic C 2.84-2.94.

Metal	Tension		Compression		Hardness	
	P-limit	Ultimate Strength	P-limit	Ultimate Strength	Brinell at 3000 kg.	Sclero- scope
Graph C 2.85 }	11,200	28,200	34,500	103,300	176	..
Comb. C 0.76 }						
Graph C 2.92 }						
Comb. C 0.60 }						

Tension specimens 0.5 in. diameter, 2 in. gage length; elongation and reduction of area negligible.

Compression specimens 0.8 in. diameter; 2.4 in. long; failure occurring in shear.

Tension set readings with extensometer showed elastic limit of 3000 lb. per sq. in.

Modulus of elasticity in tension, 13,600,000 lb. per sq. in.

ALLOY STEELS—COMMERCIAL EXPERIMENTAL VALUES

Metal	S. A. E. Spec. No.	Nominal Contents, Per Cent	S. A. E. Heat Treatment	P-Limit	Ultimate Strength	Elong. in 2 in. Per cent	Reduct. of Area Per cent	Hardness Brinell Scler.	
Steel	2315		Ann.						
Nickel	2315		H	42,500	54,000	32.0	60.0	138	..
	2335	Ni 3.50	Ann.	75,000	107,500	18.0	55.0	321	43
	2335		H	55,000	68,000	24.0	53.0	165	..
	2345	(Mn 0.65)	Ann.	151,000	186,000	15.0	51.0	465	62
	2345		H	62,500	78,000	21.0	48.0	172	..
				193,000	212,000	12.0	45.0	579	76
Invar		Ni 36.0 C 0.40	Modulus of Elasticity of Invar (Landolt), 21,300,000 lb.	71,000	110,000	30.0	50.0	...	..
Steel	3120		Ann.						
Nickel	3120	Ni 1.25	H 450 deg. C.	49,000	62,000	23.0	53.0	155	22
Chrome	3135	Cr 0.60	Ann.	85,000	116,000	23.0	48.0	270	36
	3135	(Mn 0.65)	H or D	57,000	71,300	20.0	46.0	182	30
	3220		Ann.	125,000	172,000	18.0	43.0	330	44
	3220	Ni 1.75	H or D	55,000	69,000	21.0	50.0	170	..
	3250	(Cr 1.10)	Ann.	110,000	151,000	23.0	48.0	375	50
	3250	(Mn 0.45)	M	62,000	78,000	19.0	42.0	180	..
	3220		Ann.	190,000	260,000	16.0	32.0	480	64
	3220	Ni 3.50	L	46,000	59,500	21.0	50.0	...	..
	3340	Cr 1.50	Ann.	110,000	150,000	23.0	48.0	375	50
	3340	(Mn 0.45)	P	56,000	74,000	18.0	45.0	...	..
				170,000	232,000	18.0	42.0	479	64
Steel	51120	Cr 1.00	Ann.						
Chrom-	51120	(Mn 0.35)	M or P	62,000	82,000	16.0	31.0	...	..
ium	52120	Cr 1.20	Ann.	205,000	275,000	7.0	26.0	500	66
	52120	(Mn 0.35)	M or P	62,000	82,000	13.0	24.0	...	..
				200,000	253,000	7.0	25.0	524	70
Steel	6130	(Mn 0.65)	Ann.						
Chrome	6130	Cr 0.95	T	61,500	84,500	23.0	51.0	152	..
Vana-	6195	V 0.18	Ann.	120,000	163,000	16.0	43.0	432	59
dium	6195	(Mn 0.35)	U	68,200	90,000	16.0	38.0	...	..
				250,000	330,000	8.0	24.0	562	75
Steel	9250	Si 1.95	Ann.						
Silico-	9250	(Mn 0.70)	V	60,000	77,000	16.0	28.0	...	..
Manga-	9x30	Si 0.85	Ann.	130,000	174,000	14.0	24.0	441	59
nese	9x30	Mn 1.75	V	68,000	87,000	13.0	22.0	...	..
				160,000	211,000	12.0	21.0	470	63
Steel (C 0.73)		W 2.4	Ann.						
Tung- (C 0.70)		W 9.7	Ann.	48,100	84,200	20.5	31.5	...	..
sten (C 0.47)		W 15.6		90,000	126,000	14.0	22.1	...	..
		Quench 1065 deg.	Drawn 205 deg. C.	225,000	248,000	6.0	43.0	520	64

tested to the area of the spherical indentation produced. The standard sphere used is a 10-mm. diameter hardened steel ball. The pressures used are 3000 kg. for steel and 500 kg. for softer metals, and the time of application of pressure is 30 sec. Values shown in the tables are based on spherical areas computed in the main from measurements of the diameters of the spherical indentations. Brinell hardness values have a direct relation to tensile strength and hardness determinations may be used to define tensile strengths by employing the proper conversion factor for the material under consideration.

8. Shore scleroscope hardness.—Height of rebound of diamond pointed hammer falling by its own weight on the object. The hardness is measured on an empirical scale on which the average hardness of martensitic high carbon steel equals 100. On very soft metals a "magnifier" hammer is used in place of the commonly used "universal" hammer and values may be converted to the corresponding "universal" value by multiplying the reading by 4/7. The scleroscope hardness, when accurately determined, is considered an index of the tensile elastic limit of the metal tested.

9. Erichsen value.—Index of forming qualities of sheet metal. The test is conducted by supporting the sheet on a circular ring and deforming it at the center of the ring by a spherical pointed tool. The depth of impression (or cup) in mm. required to obtain fracture is the Erichsen value for the metal. Erichsen standard values for trade qualities of soft metal sheets are furnished by the manufacturer of the machine corresponding to various sheet thicknesses, (see Proc. A. S. T. M., Vol. XVII, II, 1917, p. 200).

The following are the tables covering iron and steel and their various alloys:

Composition, approximate:

Electrolytic, C. 0.0125 per cent; other impurities less than 0.05 per cent.
Cast gray, graphitic, C 3.0; Si 1.3-2.0; Mn 0.6-0.9; S max 0.1; P max 1.2—A. S. T. M. Spec. A 48-18 allows S max 0.10 except S max 0.12 for heavy castings.
Malleable—American "Black Heart," C 2.8-3.5; Si 0.6-0.8; Mn max 0.4; S max 0.07; P max 0.2.
European "Steely Fracture," C 2.8-3.5; Si 0.6-0.8; Mn 0.15; S max 0.35; P max 0.2.

Compressive strengths (specimens tested, 1 in. cylinders 3 in. long):

Electrolytic iron, 80,000 lb. per sq. in.
Gray and Malleable cast iron, 80,000-120,000 lb.
Wrought iron, approximately equal to tensile yield point (slightly above P limit).

Density:

Electrolytic iron weighs about 487 lb. per cu. ft.
Cast iron weighs about 449 lb. per cu. ft.
Malleable iron weighs about 474 lb. per cu. ft.
Wrought iron weighs about 490 lb. per cu. ft.

Ductility: Normal Erichsen values for good trade quality sheets, 0.4 mm. (0.0156 in. thickness, soft annealed.

Depth of Impression

	mm.	in.
Sheet metal hoop iron, polished....	9.5	0.374
Charcoal iron tinned sheet.....	7.5	0.295
Second quality tinned sheet.....	6.7	0.264

Modulus of elasticity in tension and compression:

	Lb. per sq. in.
Electrolytic iron	25,000,000
Cast iron	15,000,000
Malleable iron	25,000,000
Wrought iron	25,000,000

Modulus of elasticity in shear:

Electrolytic iron	10,000,000
Cast iron	12,000,000
Wrought iron	10,000,000

Scleroscope hardness values shown are as determined with the Shore universal hammer.

Strength in shear:

Electrolytic (Remelt):	
P-limit	12,000
Ultimate strength	30,000
Commercial wrought:	
P-limit	20,000
Ultimate strength	50,000

Transverse strength, from Flexure formula:

Gray cast iron:

Modulus of rupture, 47,000 lb. per sq. in.
"Arbitration bar," 1½ in. diameter on 12-in. span.
minimum central load at rupture, 2,500-3,300 lb.
minimum central deflection at rupture, 0.1 in. (A. S. T. M. Spec. A48-18).

Steels

S. A. E. (Soc. of Automotive Eng., U. S. A.) classification scheme used as basis for steel groupings. First two digits S. A. E. Spec. No. show steel group number, and last two (or three in case of five figures) show carbon content in hundredths of one per cent.

The first line of properties for each steel show values for the rolled or forged metal in the annealed or normalized condition. Comparative heat treated values show properties after receiving modified S. A. E. heat treatment. The P-limit and ductility of cast steel averages slightly lower and the ultimate strength 10 to 15 per cent higher than the values shown for the same composition steel in the annealed condition. The properties of rolled steel (raw) are approximately equal to those shown for the annealed condition, which represents the normalized condition of the metal rather than the soft annealed state.

The data for heat treated strengths are average values for specimens for heat treatment ranging in size from ¼ to 1½ in. diameter. The final drawing or quenching temperature for the properties shown is indicated in degrees Centigrade with the heat treatment letter wherever the information is available. In general, specimens were drawn near the lower limit of the indicated temperature range.

General Note: Table on steels after Motor Transport Corps Metallurgical Branch of Engineering Division, Table

No. 88. Maximum allowable P 0.045 or less; maximum allowable S 0.05 or less. Silicon contents were not determined by Motor Transport Corps in preparing table, except for silico-manganese steels.

Compressive Strengths: For all steels approximately equal to yield point in tension (slightly above P-limit).

Density: Steel weighs about 490 lb. per cu. ft.

Ductility, Erichsen values: —0.75 mm. (0.029 in.) thick, low carbon soft annealed sheet (B. S.), depth of indentation 12.0 mm. or 0.472 in. —1.30 mm. (0.050 in.) thick, low carbon soft annealed sheet (B. S.), depth of indentation 12.5 mm. or 0.492 in.

Modulus of elasticity in tension and compression: For all steels approximately 30,000,000 lb.

Modulus of elasticity in shear: For all steels approximately 12,000,000 lb.

Scleroscope hardness values shown are as determined with the Shore universal hammer.

Strength in shear: P-limit and ultimate strength each about 70 per cent corresponding tensile values.

Explanation of Heat Treatment Letters Used in Table of Steel Data

Motor Transport Corps modified S. A. E. heat treatments for steels. (S. A. E. Handbook, vol. 1, pp. 9d and 9e, 1915, q.v. for alternative treatments.)

Heat Treatment A

After forging or machining (1) carbonize at a temperature between 870 and 930 deg. C. (1600 and 1700 deg. F.), (2) cool slowly, (3) reheat to 760 to 820 deg. C. (1400 to 1500 deg. F.) and quench in oil.

Heat Treatment D

After forging or machining (1) heat to 820 to 840 deg. C. (1500 to 1550 deg. F.), (2) quench, (3) reheat to 790 to 820 deg. C. (1450 to 1500 deg. F.), (4) quench, (5) reheat to 320 to 650 deg. C. (600 to 1200 deg. F.) and cool slowly.

Heat Treatment F

After shaping or coiling (1) heat to 775 to 800 deg. C. (1425 to 1475 deg. F.), (2) quench, (3) reheat to 200 to 480 deg. C. (400 to 900 deg. F.) in accordance with degree of temper required, and cool slowly.

Heat Treatment H

After forging or machining (1) heat to 820 to 840 deg. C. (1500 to 1550 deg. F.), (2) quench, (3) reheat to 230 to 650 deg. C. (450 to 1200 deg. F.) and cool slowly.

Heat Treatment L

After forging or machining (1) carbonize at a temperature between 870 and 950 deg. C. (1600 and 1750 deg. F.), preferably between 900 and 930 deg. C. (1650 and 1700 deg. F.), (2) cool slowly in carbonizing material, (3) reheat to 790 to 820 deg. C. (1450 to 1500 deg. F.), (4) quench, (5) reheat to 700 to 760 deg. C. (1300 to 1400 deg. F.), (6) quench, (7) reheat to 120 to 260 deg. C. (250 to 500 deg. F.) and cool slowly.

Heat Treatment M

After forging or machining (1) heat to 790 to 820 deg. C. (1450 to 1500 deg. F.), (2) quench, (3) reheat to between 260 and 680 deg. C. (500 and 1250 deg. F.) and cool slowly.

Heat Treatment P

After forging or machining (1) heat to 790 to 820 deg. C. (1450 to 1500 deg. F.), (2) quench, (3) reheat to 750 to 770 deg. C. (1375 to 1425 deg. F.), (4) quench, (5) reheat to 260 to 650 deg. C. (500 to 1200 deg. F.) and cool slowly.

Heat Treatment T

After forging or machining (1) heat to 900 to 950 deg. C. (1650 to 1750 deg. F.), (2) quench, (3) reheat to 260 to 700 deg. C. (500 to 1300 deg. F.) and cool slowly.

Heat Treatment U

After forging (1) heat to 830 to 870 deg. C. (1525 to 1600 deg. F.), hold half an hour, (2) cool slowly, (3) reheat to 900 to 930 deg. C. (1650 to 1700 deg. F.), (4) quench, (5) reheat to 180 to 290 deg. C. (350 to 550 deg. F.) and cool slowly.

Heat Treatment V

After forging or machining (1) heat to 900 to 950 deg. C. (1650 to 1750 deg. F.), (2) quench, (3) reheat to between 200 and 650 deg. C. (400 to 1200 deg. F.) and cool slowly.

Editor's Note: Oil quenching is recommended wherever the instructions specify "quench," inasmuch as the data in the table are taken from tests of automobile parts which must resist considerable vibration and which are usually small in section. The quenching medium must always be carefully considered.

The Frick & Lindsay Co., Sandusky and Robinson streets, Pittsburgh, has placed on the market the I. X. L. safety reversible car wrench for opening hopper car doors. It opens car doors without danger to the workmen and closes them by reversing the pawl. Its safety feature has recommended it to managers of industrial plants, as many accidents have occurred in opening hopper car doors with the ordinary wrench. The I. X. L. wrench is made of wrought steel, drop forged. It weighs 19 lb. and the length of the lever is 34 in.

The Lancaster Steel Products Co., Lancaster, Pa., will build a one-story addition, 50 x 310 ft. with extension, 50 x 70 ft., to be equipped as a bar mill. It is planned to increase the output by about 15,000 tons of steel per year.

The World's Iron and Steel Output

The British Department of the Economic Council of the League of Nations is already functioning. The first issue of its *Monthly Bulletin of Statistics* has just appeared and contains the following tables of the world's iron and steel production from 1913 to June of this year. The quantities are expressed in thousands of tons (of 1016 kilos.):

Pig-Iron Production

Period	United Kingdom	United States	France	Italy	Belgium	Canada	Germany
Monthly ave.:							
1913	855	2,581	427	35	204	84	1,583
1914	744	1,944	412	32	119	58	1,181
1915	727	2,493	390	31	6	68	967
1916	743	3,286	...	38	10	87	1,090
1917	778	3,221	...	39	1	87	1,078
1918	755	3,254	108	...	...	89 (c)	964
1918 Oct. (a)	886	3,487	...	...	...	...	...
Nov. (b)	649	3,354	...	...	...	...	...
Dec. (b)	627	3,434	...	...	...	...	...
1919 Jan.	664	3,302	...	...	...	...	(d) 501
Feb.	625	2,940	...	...	...	...	(d) 469
March	684	3,068	...	...	...	...	(d) 546
April	653	2,478	...	...	...	...	(d) 434
May	662	2,108	...	...	7	...	...
June	644	...	...	...	...	...	...

(a) Five weeks. (b) Four weeks. (c) Exclusive of the November and December output in the occupied districts of the Saar, Lorraine, and Luxemburg. (d) Exclusive of Alsace-Lorraine and Luxemburg.

Steel Ingot and Castings Production

Period	United Kingdom	United States	France	Italy	Belgium	Canada	Germany
Monthly ave.:							
1913	649	2,608	384	77	202 (c)	87	1,558
1914	653	1,959	...	75	114 (c)	82	1,228
1915	713	2,679	...	83	8 (c)	76	1,088
1916	766	3,564	...	104	8 (c)	106	1,327
1917	817	3,053	...	...	1	130	1,361
1918	...	(d) 2,989	...	...	...	141 (e)	1,129
1918 Oct. (a)	1,028	3,344	...	...	...	...	...
Nov. (b)	595	3,060	...	...	...	...	...
Dec. (b)	609	2,992	...	...	...	...	...
1919 Jan. (c)	10	3,082	...	...	...	...	(f) 568
Feb. (c)	34	2,698	...	...	...	...	(f) 524
Mar. (c)	784	4,275	...	...	...	...	(f) 644
April (c)	669	2,666	...	...	...	...	(f) 435
May (c)	748	2,259	...	...	8	...	...
June (c)	625	...	...	...	...	...	...

(a) Five weeks. (b) Four weeks. (c) Ingots and castings. (d) Cannot be given. (e) Exclusive of the November and December output in the occupied districts of the Saar, Lorraine, and Luxemburg. (f) Exclusive of Alsace-Lorraine and Luxemburg.

Standard Structural Sections in Australia

WASHINGTON, Aug. 26.—A bulletin of the Canadian Department of Trade and Commerce tells of a conference at Melbourne, Australia, which has just concluded the standardization of structural steel sections in that country. The conference was attended by representatives of the producers and users of structural steel, including public departments of the states and the commonwealth and engineering and architectural institutes throughout Australia. The object of the conference was to bring about changes in the sections to meet the conditions of manufacture in Australia, and also to agree upon a reduction in the number of steel parts that users in Australia would demand from makers and thereby reduce the cost by eliminating those for which there is little demand.

It is stated that the result has been satisfactory and that a series of structural shapes has been defined which will enable Australian manufacturers to meet practically the whole requirements of the commonwealth. A certain number of sections is to be allocated to each steel rolling mill, which it will manufacture exclusively, and thus be insured a quick turnover on its outlay, and, on the other hand, users will have at their disposal a constant supply of standard sections.

The extension of the rail mill at the plant of the Algoma Steel Co., Sault Ste. Marie, Ont., which was announced several weeks ago, and which will cost several hundred thousand dollars, is but the beginning of an extensive development of the plant. The whole plan laid out by the officials of the company involves an expenditure of from \$5,000,000 to \$7,000,000, and includes the production of structural steel shapes of all kinds and sizes.

New Horizontal Drilling and Boring Machine

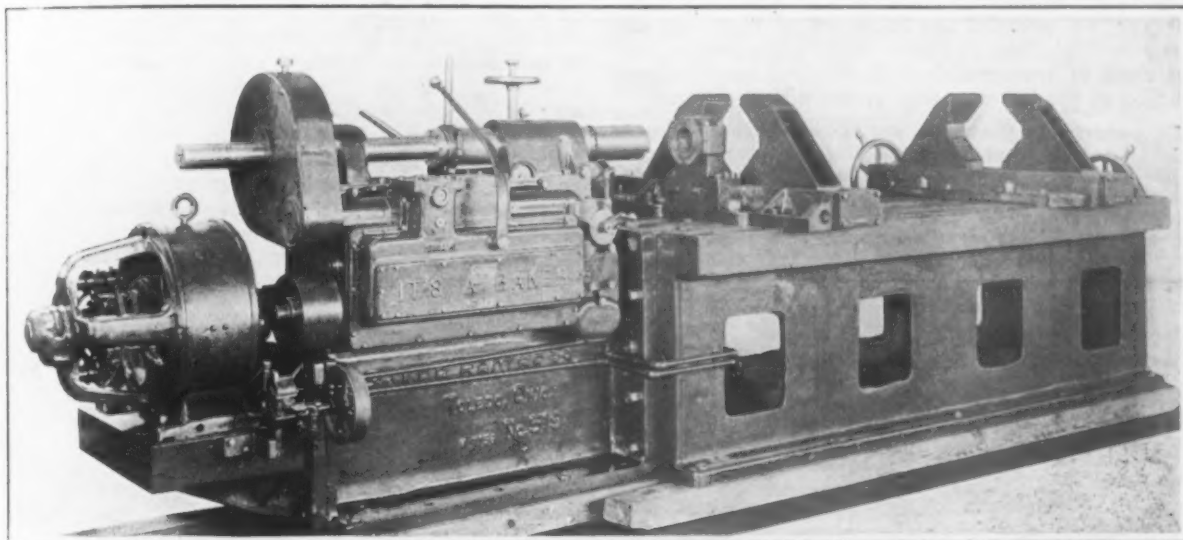
A new design of horizontal drilling and boring machine for high speed and heavy duty work is being manufactured by Baker Brothers, Toledo, Ohio. The new machine was designed with the object of improving the head construction. The spindle, speed and feed drive are similar to the Baker 513 high-speed drills, the spindle being fixed in a rigid head of heavy design, which permits coarse feeds and a capacity for driving 5-in. high-speed drills in steel. A constant speed is secured with hardened gearing running on annular ball bearings, cased in an oil-tight box. A 15-hp., 1200-r.p.m. motor is set on a bracket at the end of the machine and belted direct to the speed box. The control is with sliding gears, a minimum number in mesh at one time and eight speeds are possible between about 11 r.p.m. to 151 r.p.m. Through a reversing tripping box an automatic back feed is given to bore through

to perfecting the finished product, all of them may be converted readily to commercial industries. The Government has had this plant surveyed by engineers, and their reports point out the adaptability of this war project for chemical manufacturing and cotton and wood pulp paper making.

Information concerning the plant and its facilities, and the terms and conditions of the sale, may be obtained by communicating with Chairman, Ordnance District Salvage Board, 1710 Market Street, Philadelphia, or the officer in charge of the plant at Nitro, W. Va., or the Plant and Plant Facilities Section, Office of the Director of Sales, Munitions Building, Washington.

Will Discuss Vital Problems

The vital problems of business, multiplied by post-war and industrial developments, will be discussed at a national conference to be held in Chicago Sept. 8 and 9 under the auspices of the Illinois Manufacturers'



A Head of New Design Has Been Incorporated in This High-Speed Heavy-Duty Horizontal Drilling and Boring Machine

and face or counterbore on the back side. The machine has a working table of large surface, equipped with wide oil grooves for cutting lubricant and tee slots for clamping fixtures and work. It is also equipped with an oil pump. The machine in the accompanying illustration was built for drilling locomotive axles and crank pins.

Entire Town of Nitro for Sale

WASHINGTON, Aug. 26.—The War Department is offering a \$70,000,000 city for sale. It has called for bids for the entire town of Nitro, W. Va., built on the Kanawha River as a site for the second largest smokeless powder plant in the world. This unique sale will embrace the complete manufacturing community of 737 industrial building and housing accommodations for 20,000 people, and the utilities and civic improvements that constitute the conveniences of a modern city.

It cost the Government approximately \$70,000,000. The bids, which must cover not only the powder plant and the other industrial units which were erected to prepare the ingredients essential to powder making, but the civic community as well, to which the United States holds title, will be opened at 12 o'clock noon on Sept. 30, at the office of the chairman of the Ordnance District Salvage Board, 1710 Market Street, Philadelphia.

The town covers 1800 acres and represents eight months of hurried war construction work. Ground was broken for the plant Feb. 1, 1918, and just 10 days before the signing of the armistice the plant began production. In the 10 days it turned out 6,000,000 lb. of powder.

Though each of the many units embraced in the great plant was designed to produce some ingredient of smokeless powder or perform some function essential

Association. The sessions will be at the Congress Hotel.

Trade and industrial associations in every line have been invited to appoint delegates, and to participate in what is believed will be a meeting of moment, inasmuch as it will enable business to present concretely its attitude on some of the questions now before the lawmakers at Washington, and some of the proposals of a revolutionary nature that have been presented from various sources in the past few months.

Leaders of organized labor have also been invited to talk, and to state where the demands of workers are going to stop.

Some of the subjects which it has been suggested be discussed at the conference are the following:

- Participation in Private Business on the Part of the Federal Government.
- Nationalization of Industry.
- Influence of Exports on Prices and Production.
- Possibilities of Increasing Production.
- The Relation of the United States to the Rehabilitation of Industry in Europe.
- Stabilization and Guarantee of Contracts.
- Definition of Profiteering.
- The Attitude of Employing Farmers and Manufacturers to Labor.
- Adjustment Between Property Rights and Community Interests.
- Participation of Labor in the Management of Industry.
- Increasing the Purchasing Power of the Dollar.
- Distribution of the War Debt.
- Governmental Price Fixing.
- The Plumb Plan.
- The Solidarity of Farming and Business Interests.

The Coatesville Scrap Iron & Steel Co., Coatesville, Pa., has been incorporated with a capital of \$200,000 by V. E. Bergstrom and associates.

MACHINE TOOLS TO SCHOOLS

Senate Passes Bill for Sales to Be Made at Reduced Prices

WASHINGTON, Aug. 26.—With but little discussion and no opposition the Senate has passed the bill providing for the sale of surplus machine tools held by the War Department to trade and technical schools at reduced prices. The bill is now pending before the House committee on military affairs, which already has approved a similar bill originating in the lower branch of Congress. Early action is expected in the House. The chief difference between the Senate bill and the measure which has been on the House calendar for some time is that the former provides that the tools shall be sold for not less than 20 per cent of their cost, while the latter fixes 10 per cent as the minimum.

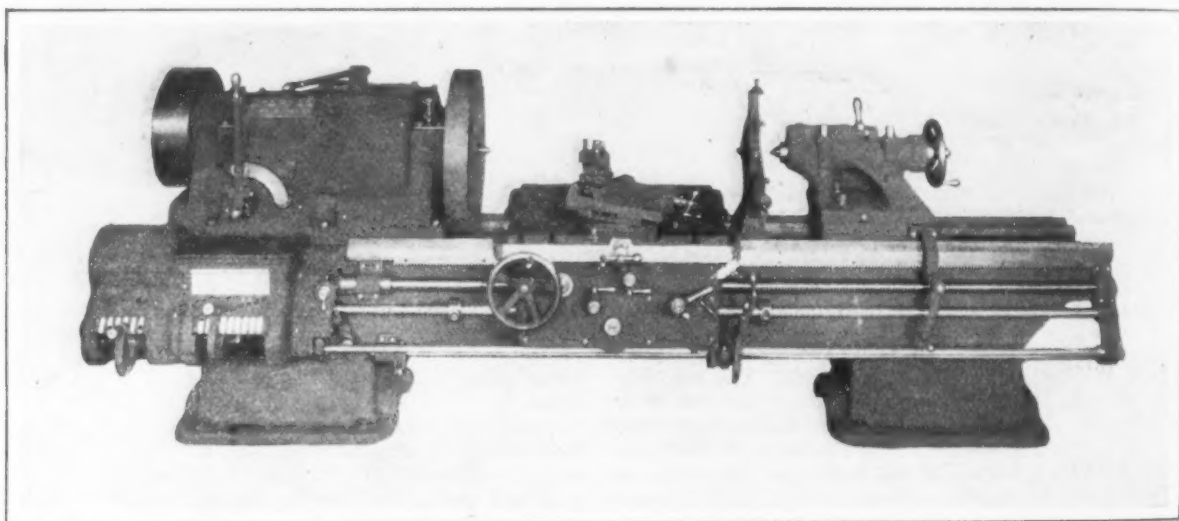
At the suggestion of Senator Smoot, of Utah, an amendment was inserted by the Senate, the effect of which is to require the purchasers to pay the freight charges. As amended the Secretary of War may use money derived from the sale "to defray expenses, except costs of transportation, incident to distribution". The text of the bill as passed by the Senate follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the Secretary of War be and he is hereby authorized under such regulations as he may prescribe, to sell at not less than 20 per centum of their cost, to trade and technical schools and universities, and other recognized educational institu-

New 24-in. Geared Head Lathe

A 24-in. single pulley driven, geared head engine lathe has been placed on the market by the Greaves Machine Tool Co., 2116 Colerain Avenue, Cincinnati. The machine is adaptable for both light and heavy work. The apron is of box form and the side and rear walls are cast integral, the front plate being removable. The gears are of steel and all studs and gears are supported at both ends and are oiled from one centralized point. The rack pinion has an additional outboard bearing at the inner face of the rack. Adjustable longitudinal feed stops are provided for the carriage operating in either direction. A positive lockout is provided that prevents engaging the feeds and lead screws at the same time.

The longitudinal and cross feeds are operated by positive clutches, and can be engaged or disengaged by a quarter turn of handles on the apron. Both cross and lateral feeds can be engaged at the same time. The feeds and lead screw are reversed in the headstock by a lever operating at the right side of the apron. The ratios of lateral and cross feeds to lead screw are 10 to 1, making it possible to cut scrolls or spirals from 5 to 280 per in. Special or coarser scrolls or spirals may be cut by changing the outer gears on the quick change box. Engaging the lateral and cross feeds simultaneously causes the tool to follow a path forming an angle of 45 deg. with the center line, or a 24-in. taper per ft. By using the taper attachment in conjunction with the two feeds the angle can be increased



A Geared-Head Lathe Adaptable for Both Light and Heavy Duty. The apron is of box type with removable front plate

tions, such machine tools as are suitable for their use which are now owned by the United States of America and are under the control of the War Department, and are not needed for Government purposes. The money realized from the sale may be used by the Secretary of War to defray expenses, except costs of transportation incident to distribution of the tools, and the balance shall be turned into the Treasury of the United States.

Positions Open at Government Armor Plant

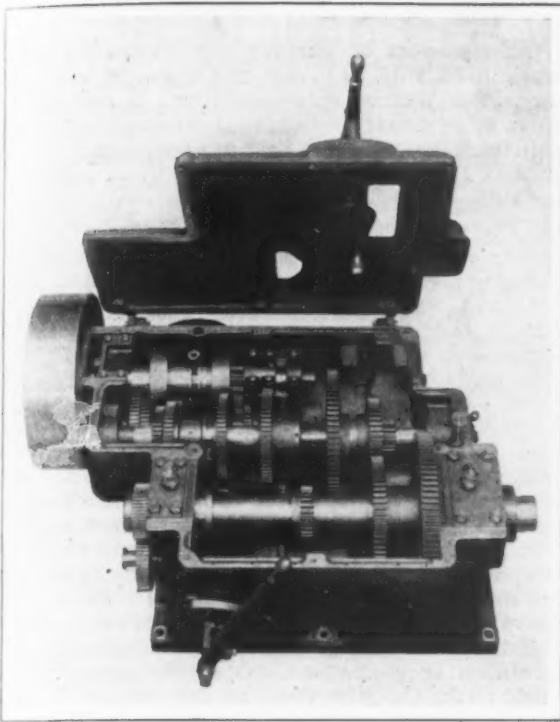
The civil service openings for a superintendent of forge shops and superintendent of melting shops at \$5,000 a year, announced in THE IRON AGE, Aug. 21, are in the new Naval Ordnance Plant, South Charleston, W. Va. Other positions open in these works are: Foreman of heat treatment on large guns, \$8 to \$12.56 a day; foreman of 14,000-ton presses for armor plate and guns, \$11.84 to \$13.28 a day; foreman of small guns, \$8 a day; and foreman of heat treatment of projectiles, \$8 a day. Candidates for these positions apply to the Civil Service Commission, Washington, D. C.

The Laclede Steel Co., St. Louis, has leased 7000 sq. ft. of the recently finished Arcade Building as a new location for its offices.

or decreased to form a maximum of 30 in. per ft., or a minimum of 18 in. per ft.

The bed is braced with box section girths which extend the full depth of the bed, and a double wall brace is cast lengthwise in the center of the bed, extending its full length. A rack on top of the girths engages a pawl which braces the tailstock against the tail end thrust when heavy work is placed between the centers. The carriage has a full length bearing on each V and a wide flat bearing on the inside of the front V. A chasing dial is provided for thread cutting which can be disengaged when not in use. The movements of the carriage are controlled by a lever on the right side of the apron, which operates the lead screw and feed reverse mitre gears in the headstock.

The lower, center and upper slides of the compound rest are rectangular in shape, so as to eliminate the overhang of tools at any angle at which the rest is set. The cross feed and top slide screws have micrometer dials graduated in thousandths. The bottom slide is graduated for any angle up to 90 deg. The tailstock has a wide tongue on the base fitted into a groove in the head spindle and at the same time to take end thrust when cutting toward the tailstock. Provision is made for set-over by two screws and the base is



Fifty-four Screw Thread and Feed Changes Are Provided by a Quick Change Gear Box on this 24-in. Engine Lathe. Sliding gears provide 12 speeds ranging from 7 to 300, arranged in geometric progression.

graduated in sixteenths so that the set-over may be accurately read. The spindle is clamped by two plugs spaced 7 in. apart, thus to avoid springing the spindle out of alignment. The clamping is by a single lever. The tailstock is designed to permit the compound rest to be swiveled to 90 deg. when turning short work of small diameter.

The quick change gear box is a separate unit mounted on the front of the bed and contains the mechanism for making 54 screw thread and feed changes. Two handles are used to obtain the entire range of threads and feeds. A quadrant provides for cutting any special threads, including metric. Guide slots are milled in the front of the box which guide the gears into correct position before engagement.

The geared head with single pulley drive has 12 speeds, ranging from 7 to 300, in geometric progression, that are obtained with sliding gears. No frictions are used except on the driving shaft for forward or reverse motion. The start, stop, reverse and speeds are controlled by a single lever. Any speed may be obtained while the machine is under cut by a right or left movement of the lever. The action of the lever is self-locking, so that the gears cannot be shifted until the friction is released. The start, stop and reverse of the spindle is controlled by a lever at the right side of the apron. Power is transmitted to the spindle through gears directly back of the front spindle bearing, thus to eliminate vibration or torsional strain on the spindle. The lever at the front of the headstock engages the spindle direct or through the back gears, and it also has a neutral position which permits revolving the spindle by hand for chucking or similar work.

Attention is called to the fact that as the ratio of the gearing in the head is very high and the strain on the drive shaft is comparatively light a pivoted motor belt drive is recommended. The motor which acts as a belt tightener is attached to a bracket which is pivoted in the cabinet leg on the back side of the lathe and exerts an 80-lb. tension for each inch width of the belt. Expensive motor control is eliminated by the use of a constant speed motor. The motor can be placed on top of the head of the machine, belting down to the drive pulley, the motor being stationary but adjustable for tightening the belt. Gearing may also be substituted in place of the belt where desired.

SURPLUS MATERIAL

Government Offers Ground Manganese Ore— Large Total to Date

WASHINGTON, Aug. 26.—The Surplus Property Division of the Office of the Quartermaster General of the Army is now offering for sale under sealed proposals 239,656 lb. of ground manganese ore, located at New Cumberland, Pa., bids for which will be opened by the Surplus Property Officer, Zone Supply Office, 21st Street and Oregon Avenue, Philadelphia, at 10 o'clock on the morning of Sept. 12, 1919. This material is in two lots, the first consisting of 179,878 lb., packed in bags of 195 lb. each. The second lot consists of 59,778 lb., packed in barrels holding about 875 lb. The analysis of this ore is approximately as follows: Manganese 53.90 per cent; iron, 1.0 per cent; silica, 4.72 per cent; phosphorus, 0.104 per cent; sulphur, 0.01 per cent.

The same office is also offering for sale 400 blacksmiths' anvils, located at New York, bids for which will be opened, Sept. 18, by the Surplus Property Officer, Zone Supply Office, 461 Eighth Avenue, New York.

Another lot of material similarly offered, by the New York Zone Supply Office, comprises 38,400 new steel spades, located at New York. Bids open Sept. 10.

According to a War Department announcement, War Department surplus materials sold during the week ending Aug. 15, 1919, amounted to \$5,107,173.81, making a total of \$393,336,100.42 for sales embraced in the period from Jan. 1, 1919, to Aug. 15. Transactions by the Surplus Property Division of the Office of the Quartermaster General amounted to \$3,458,289.24. The Ordnance Department sales for the week totaled \$1,034,411.60. Of this \$293,457 represented ferrous metals and scrap, \$193,746 the sale of nonferrous stocks.

Safety Attachment for Riveting Hammers

A new safety attachment for pneumatic riveting hammers called the Boyergrip is being placed on the market by the Chicago Pneumatic Tool Co., Chicago. The device fits over the muzzle of the hammer and provides a grip with an unobstructed view of the work. It is adaptable to either right or left handed driving and is suitable for use on chipping or calking hammers.



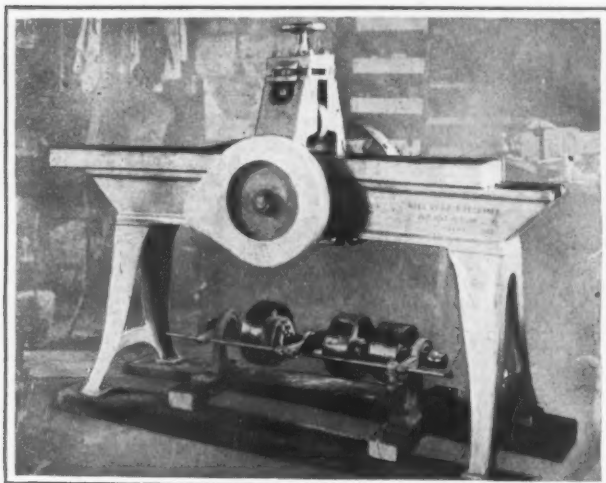
The Device Makes It Unnecessary to Grasp the Heated Cylinder and Serves as a Safe Set Retainer

The grip locks automatically insuring safety from the accidental shooting of the chisel. The Boyergrip is made to fit practically all sizes of pneumatic hammers.

The Youngstown Sheet & Tube Co., Youngstown, has issued the initial number of its Bulletin, a 16-page publication intended for the promotion of good feeling and co-operation among its employees. It is devoted almost exclusively to the personal activities and avocations of the workers in the various plants.

Seam Rolling Machine

A machine especially designed for the purpose of rolling seams in band instrument factories has been brought out by the Winterhoff Tool & Machine Co., Elkhart, Ind. These seams are of a lap joint held in place while brazing with small notched teeth. After the seam is brazed a hardened steel mandrel is placed inside of the tube, so that the seam comes directly on top of the mandrel, which may be square or round. The mandrel with tube is then placed on the table of the machine, the friction of the roll on the tube causing



The Lap Joint of a Sheet Metal Seam Is Rolled or Planished by Mounting on a Mandrel, Placing It on the Table and Rolling It Under the Wheel Housed Above

it to be fed through under the roll, so rolling or planishing the seam to an even thickness.

The table of the machine travels at a speed of 6 ft. per min., and is driven by back gearing. It is reversed by hand at the end of stroke, or as to length of tube, by means of a countershaft with friction pulleys. The roll adjustment is with a set of three gears lowering the roll evenly. The handwheel is graduated in thousandths.

Mining Engineers' Chicago Meeting

A comprehensive program has been prepared for the one-hundred and twentieth meeting at Chicago of the American Institute of Mining and Metallurgical Engineers during the week of Sept. 22. Monday, Sept. 22, will be devoted to sessions on coal and gas, on geology as well as on milling. At the session on geology two papers will be presented on chrome ores by E. F. Burchard and by J. S. Diller in person, as well as a paper by Mr. Burchard on "Manganese Ore Deposits of Cuba."

The session on iron and steel will be held on Tuesday and Wednesday, Sept. 23 and 24 for which the following programs are scheduled:

TUESDAY, SEPT. 23, 2 P. M.

- "Blast-furnace Refractories," by Raymond M. Howe.
- "Effervescing Steel," by Henry D. Hibbard.
- "Aircraft Steels," by Albert Sauveur.
- "Determining Gases in Steel and the Deoxidation of Steel," by J. R. Cain.
- "Effect of Time and Low Temperature on Physical Properties of Medium-carbon Steel," by G. A. Reinhardt and H. L. Cutler.
- "Erosion Tests of Rifle Barrels," by A. E. Bellis.
- "Metallography of Rifle-barrel Steel," by G. F. Butterworth.

TUESDAY, SEPT. 23, 8 P. M.

- "Industries of the Chicago District," by T. W. Robinson. Lantern slides, etc.
- "Manufacture of Steel Rails," by Robert W. Hunt.
- "The World's Largest Plate Mill," by C. L. Huston.

WEDNESDAY, SEPT. 24, 10 A. M.

- "Cooling Properties of Technical Quenching Liquids," by N. B. Pilling and T. D. Lynch.
- "Differential Crystallization in Cast-steel Runner," by Francis B. Foley.
- "Manufacture and Properties of Light-wall Structural Tubing," by H. J. French.
- "Oxygen in Cast Iron and Its Application," by Wilford L. Stork.
- "Graphitization of White Cast Iron Upon Annealing," by Paul D. Merica and L. J. Gurevich.
- "Experimental Data Obtained on Charpy Impact Machine," by F. C. Langenberg.
- "Heat Treatment of Cast Steel," by John H. Hall, Arvid E. Nissen and Knox Taylor.

"Deep Etching of Rails and Forgings," by F. M. Waring and K. E. Hofmann.

Other sessions on Tuesday and Wednesday will be devoted to oil, sulphur in coal, and to non-ferrous metallurgy. For Wednesday evening there is announced a session on pyrometry with special reference to iron and steel metallurgy, which is held in co-operation with the National Research Council and the U. S. Bureau of Standards. The program for this follows:

- "Report of Committee on Pyrometry of National Research Council," by George K. Burgess.
- "Pyrometry in Blast-furnace Work," by P. H. Royster and T. L. Joseph.
- "Pyrometry and Steel Manufacture," by A. H. Miller.
- "Electric Open-hearth and Bessemer Steel Temperatures," by F. E. Bash.
- "Some Thermal Relations in the Treatment of Steel," by Charles F. Brush. Illustrated by lantern slides.
- "Pyrometry in the Tool Manufacturing Industry," by J. V. Emmons.
- "Rate of Heating and Cooling of Large Ingots for Forging," by F. E. Bash.

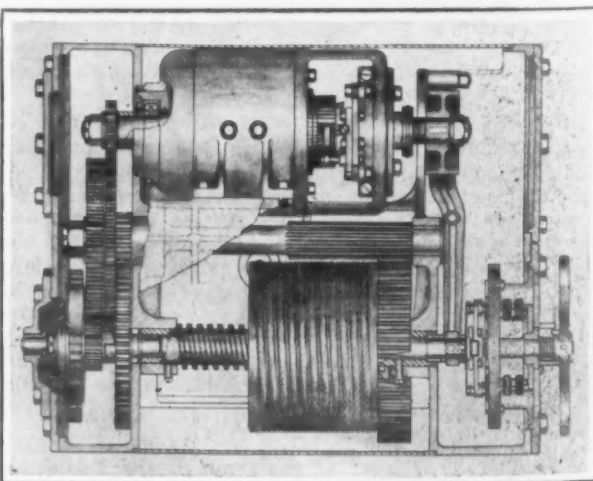
Thursday, Sept. 25, is to be devoted to a session on pyrometry at which over 50 papers are scheduled covering every phase of the subject, many of which are to be presented by the authors or their representatives.

Trips of inspection include the Gary steel plant, tungsten and molybdenum reduction plants and mining machinery manufacturing plants at North Chicago and Milwaukee as well as smelters, refineries and mines at La Salle, East Chicago and many metallurgical and manufacturing plants in Chicago. The banquet is to be held at the Congress Hotel on Sept. 24.

Papers marked * will be presented by the authors.

Industrial Hoist of Low Design

A new hoist intended for use where headroom is limited has been developed by Victor R. Browning & Co., Cleveland. All moving parts are contained in the main casting, which is divided into four sections. In one end are the gears and a disk load brake, which revolve in oil. At the opposite end of the casting are the motor shaft and control. Between these two compartments are two others containing the motor and the hoisting drum. Either a direct or an alternating-current motor may be employed. The cable is fed through a bushing directly to the grooving of the drum and the drum is carried along a threaded shaft to accommodate



Sectional View of Hoist Adapted to Conditions of Limited Headroom

the arrangement. The drum is equipped with a limit attachment at both ends to prevent over-travel. The hoist may be attached to an I beam, trolley or fixture.

A resolution providing for the payment of all obligations incurred by the War Department on construction contracts up to the signing of the Army Appropriation Bill has passed Congress. It covers all contracts entered into by the War Department up to July 11, 1919. In this connection survey of work done by general contractors on Government camps, which is affected by the Army Appropriation Act, is being taken by the Associated General Contractors of America, 111 West Washington Street, Chicago.

British Machine Tool and Metal Industries

American Trade Commissioner Sent Abroad by Department of Commerce Makes a Detailed Report Covering Conditions in Great Britain

—BY ALEXANDER LUCHARS—

[A few months ago the Department of Commerce, at the solicitation of American machine-tool builders, appointed Alexander Luchars, publisher of "Machinery," as special trade commissioner to investigate conditions in the machine tool and metal-working industries abroad. Mr. Luchars's first report, which has just been received by the Department of Commerce, is now released for publication.]

LONDON, July 23, 1919.

LABOR is the dominating factor in the British industrial situation. All industry is waiting to see what labor is going to do. With the signing of the armistice everyone felt that peace was a foregone conclusion, and during the period of readjustment which followed, progressive manufacturers were planning future developments and strengthening their selling organization, especially in foreign markets, and the work of preparation was well under way; but the element of uncertainty holds back the actual performance.

New Plants and Extensions

With the exception of plants formerly engaged in munition manufacture, activity is the rule among machine tool and metal manufacturing industries here, caused principally by the changes from war to peace production; and as considerable time will be required to complete such changes, this activity will probably continue unless the labor troubles result in a complete stoppage of manufacture. British manufacturers of all kinds have been carrying on for a period of nearly five years without being able to make changes or enlargements to their plants, except for war work, and many firms are now taking advantage of the removal of building restrictions, whenever material is obtainable and labor conditions permit, to carry out contemplated extensions which are necessary to enable them to handle the volume of work in hand and being offered.

The turnover from war to peace production is well illustrated in the case of Sir W. G. Armstrong, Whitworth & Co., Ltd., one of the largest armament makers in the country. Although every provision has been made for the quick resumption of war work if future events demand it, the main works at Elswick, Scotland and Openshaw are being rearranged for the manufacture on a large scale of machine tools, locomotives, marine engines and turbines, brass and other non-ferrous alloys (including brass and bronze powders), castings, stampings, and pneumatic tools, as well as all classes of commercial shipbuilding. Motor car construction and the manufacture of electric power plant are also to be resumed. New shops and a large increase of plant are being provided for the machine tool and small tools department. The manufacture of tools will follow the best modern methods, and it is stated that "all standard types will be produced."

Other well-known machine tool firms making extensions are: J. Butler & Co., Halifax, manufacturers of planers, shapers and slotting machines, who are erecting new works; William Asquith, Ltd., Halifax, manufacturers of boring and drilling machines, who are generally remodeling their plant and re-equipping a large works formerly used for shell production; Dean, Smith & Grace, Ltd., Keighley, manufacturers of lathes, who will double the size of their existing works; Denham's Engineering Co., Ltd., Halifax, manufacturers of lathes and slotting machines, who are making enlargements and installing new plant; the Churchill Machine Tool Co., Broadheath, Manchester, manufacturers of grinding machinery, who are building works which will cover about fourteen acres; Smith & Coventry, Ltd., Salford,

Manchester, manufacturers of milling machines, who are also erecting new works, and H. B. Clay & Co., Birmingham, manufacturers of milling cutters and small tools, who are taking over a fair sized works.

The Demand for Machine Tools

All these firms and others not mentioned are full of orders; in some cases it is stated that they are sold up for 18 months. The fact that large numbers of second-hand tools are being placed on the market does not materially affect orders in some lines, although there are still large quantities to be sold. Up to the present such tools have brought surprising figures, in some cases much more than their original price. The same conditions apply to new tools of certain kinds that are in great demand, due to the efforts of other industries to resume operations for which they must have tools of some kind, if only for temporary use, and also because hardly any machine tool maker is producing to capacity, principally on account of labor difficulties. Complaints of backward deliveries of new tools are frequent, one case being where a firm has been waiting over nine months for some presses not yet delivered. Until the extensive reorganization work mentioned is complete this condition will continue. Many of the machine tool builders would be enjoying a run of prosperity equal to that of the war if they could produce to capacity. The volume of business is very large and the excess profits tax has been reduced from 80 per cent to 40 per cent minimum, increasing the net profit in some cases. Most of the tools turned out on home account are being used to supplement existing equipment, but the new motor car industry requires a large proportion.

Changes in Manufacturing Methods

There is a greater tendency towards specialization, because British machine tool makers had plenty of object lessons of its value during the war, but many large machine tool makers are notable exceptions, still continuing their old methods practically without change. Some firms are building a larger number of sizes than their capacity warrants; others, a larger number of lines than they can produce profitably; both methods result, as we know, in unnecessary increase in costs, the machines being produced in small lots, sometimes only two or three of a kind. One well-known concern makes no less than twelve different types of machines, including engine lathes, hand screw machines, milling machines, turret lathes, gear cutting machines, drilling and tapping machinery, boring machines, planers, shapers, slotters and grinding machines. A lot of "two dozen" standard tools, such as lathes or drilling machines, is here regarded as a large "batch." There are hundreds of small employers operating shops with a handful of work people, men, women, boys and girls, who will continue to operate in the same way to which they have been accustomed for a generation or more. They have practically no overhead to think about and are making a good living at present prices. They cannot afford the high-priced machinery, automatics, etc., with which they compete to some extent, and are troubled with no ambitions, satisfied to live from day to day as their fathers and grandfathers did. Why worry?

In America we are rapidly forgetting the lessons of self-denial and thrift learned during the war, and the same is true here—especially as the English are more ready to return to old ideas than we are.

Little is being done in designing new tools, perhaps on account of the various conditions referred to above,

and as few changes have been made in design, not many new catalogs have been printed.

Some British Combinations

A tendency toward specialization and to a consolidation of their lines is noticed in some cases, the principal one being that of the Associated British Machine Tool Makers, Ltd., consisting of eleven large concerns that have combined not only for marketing purposes, but for the purpose of improving designs and reducing manufacturing costs. Each works now concentrates on a limited number of types, so that large lots of similar machines are turned out on a repetition basis in the American way. Each firm retains its identity, ownership and control, neither capital nor other interests being pooled. The Associated British Machine Tool Makers, Ltd., comprise:

James Archdale & Co., Ltd., Birmingham, medium-sized drilling machines; milling machines, horizontal and vertical.

William Asquith, Ltd., Halifax, large radial drills.

J. Butler & Co., Halifax, planers, shapers and slotting machines.

Churchill Machine Tool Co., Manchester, grinding machinery.

Kendall & Gent, Ltd., Manchester, planer-millers, vertical millers, horizontal boring and milling machines.

John Lang & Sons, Ltd., Johnstone, Glasgow, lathes.

Thomas Shanks & Co., Johnstone, Glasgow, heavy machine tools for railways, shipbuilding, marine engine work, etc.

J. Parkinson & Son, Shipley, universal millers and gear planers.

Geo. Richards & Co., Broadheath, Manchester, turning and boring mills; drilling, boring and milling machines, side planers; keyway milling machines.

Smith & Coventry, Ltd., Salford, Manchester, sensitive drills, relieving lathes, horizontal milling machines, and bevel-gear planers.

H. W. Ward & Co., Ltd., Birmingham, capstan lathes, hand screw machines, and turret lathes.

A very wide range of tools is covered by the association, and to enable them to quote for complete equipment they have taken up sole agencies for other non-competing manufacturers. To ensure adequate representation abroad they have opened branch offices in Belgium, France, Holland, Italy, the Argentine and India, with a competent engineer as manager, assisted by a staff of expert machine tool representatives in each office.

Besides the Associated British Machine Tool Makers, Ltd., associations of manufacturers of the following products have been formed:

MILLING CUTTER MANUFACTURERS' ASSOCIATION—Formed in 1918 "to deal with all matters interesting or affecting the makers of these tools"; membership believed to be large, but details not procurable. Secretary, P. M. Archer, Sir W. G. Armstrong, Whitworth & Co., Ltd., Openshaw, Manchester.

BRITISH SCREWING TACKLE* MANUFACTURERS' ASSOCIATION—Formed in 1918 "to look after the interests of the screwing tackle industry." Honorary Secretary, Mrs. F. Turrell, the Coventry Ordnance Works, Ltd., Coventry.

BRITISH GAGE MANUFACTURERS' ASSOCIATION, LTD.—Formed in 1918 "with the object of encouraging, promoting and protecting the British gage manufacturers' industry and generally to watch over and protect the interests of the gage manufacturers of Great Britain." Secretary, A. L. Pallthorpe, 44 Caxton House, London, S. W. 1.

ASSOCIATION OF BRITISH DRIVING CHAIN MANUFACTURERS—Formed to develop the use and application of chain driving, the value of which its manufacturers feel is not yet appreciated by power users, and to keep down the cost of chain driving. The policy projected includes the standardization of chains, wheels, and chain wheel cutters to ensure interchangeability; elimination of unnecessary sizes of chains, which have been a source of confusion and difficulty to the user; increasing the output so as to secure a larger share of overseas business than at present. The members of the Association are the Alfred Appleby Chain Co., Ltd., Birmingham; Brampton Bros., Ltd., Birmingham; the Coventry Chain Co., Ltd., Coventry; and Hans Renold, Ltd., Didsbury, Manchester.

The last four associations mentioned are apparently

*Taps, dies, wrenches and chasers.

not intended as selling organizations, so far as I have been able to learn.

New Lines Added

Some examples of permanent additions to lines since 1914 are furnished by:

Denham's Engineering Co., Ltd., Holmfild, Halifax; 13-in. tool-room lathes; 17-in. high-speed lathes.

Colchester Lathe Co., Colchester; all-g geared head lathes.

Clifton & Baird, Ltd., Johnstone, Glasgow; high-speed friction sawing machines.

James Bennie & Sons, Govan, Glasgow; punching and shearing machines, built-up steel-plate type.

Stephen Stell & Co., Ltd., Keighley; 15-in. and 19-in. engine lathes.

C. Redman & Sons, Halifax; 43-in. swing surfacing and boring lathe.

The Power Plant Co., Ltd., West Drayton; Sykes gear generating machines.

Oldfield & Schofield, Ltd., Halifax; precision grinders and pillar shaping machines.

New Fortuna Machine Co., Ltd., Bristol; internal grinding spindles.

Morton & Weaver, Coventry; plain grinding machines.

Monometer Mfg. Co., Ltd., Birmingham; die-casting machines.

D. Mitchell & Co., Ltd., Keighley; 48-in. radial drilling machines.

John Lang & Sons, Ltd., Johnstone, Glasgow; light pattern lathes.

Jones & Shipman, Ltd., Leicester; plain and universal grinders; radial race grinders; heavy duty drilling machines, to drill 3 in. from solid.

Humpage, Thompson & Hardy, Bristol; gear hobbing machines.

G. & A. Harvey, Ltd., Govan, Glasgow; all-g geared head lathes, 18-in. to 36-in. centers.

Motor Car Manufacture

In this industry, which is protected by an import duty of 30 per cent, reorganization work is more in evidence than in any other. Motor car manufacturers, during the war, built up enormous works which were engaged principally on munitions and war material. These factories are being re-equipped to carry out comprehensive post war programs and require a large supplementary amount of equipment. In some cases entirely new machinery must be installed, the existing plant being practically useless for economical motor car production. It is unlikely that new cars will be produced in anything like quantity this year and the high prices of automobiles will therefore continue. Some firms have been more fortunate in respect to changing over than others; for example, Sunbeam Motors, Rover Motors, Claytons and Crossley Motors were engaged on car production during the war, and can soon change to the new models.

Agricultural Machinery

The impetus given to domestic agriculture during the war has resulted in a marked increase in the output of farm tractors, the manufacture of which has not only been taken up by the east country agricultural machinery makers, but by motor car and other concerns, notably the Austin Motor Co., Ltd., Birmingham; D. L. Motor Mfg. Co., Ltd., Motherwell, and Melchior, Armstrong & Dessau, Ltd., London. In the main, these tractors follow the American four-wheel type, with engines arranged to start on gasoline and run on a heavier oil fuel.

Other developments, in response to growing demand, are in connection with motor ploughs, steam tractors and small gasoline and oil engines, coupled to pumps or electric generators for working in isolated locations.

Twist Drill Machinery

The extraordinary demand for twist drills has directed some attention to the production of twist drill machinery. Two concerns, Herbert Hunt & Sons, and Isaac Best, Ltd., both of Manchester, are specializing on a line of machines for twist drill turning, pointing and cutting-off, grooving, clearance milling and groove grinding.

Chucks and Small Tools

Strong competition has been started in the manufacture of American scroll chucks and in small tools

such as center drills and counterbores, boring-bars, tool-holders, drill sleeves and sockets, etc. The manufacture of lathe chucks has been taken up by F. Pratt & Co., Ltd., of Halifax, who have changed over from the manufacture of machine tools and will specialize on chucks. Another large firm, Jones & Shipman, Ltd., of Leicester, is devoting several departments to the above product. One department is given over to the manufacture of scroll type self-centering chucks and another to the manufacture of Slocumb type center drills and countersinks, both of these departments being self-contained and under the charge of different works managers. It is said that the selling price will be considerably less than that for which the American product can be sold for here; taking sleeves and sockets as an example, Jones & Shipman have reduced manufacturing costs to a figure that will allow them to undersell the cheapest German product offered here before the war.

Steel and Other Industries

The Sheffield steel manufacturers and kindred industries have also a large share in the reconstruction work. These firms generally have profited by their experience during the past four years, and in addition to modernizing their works, are reorganizing their selling departments, and changing over from large shell, gun and similar production. For example, Hadfields, Ltd., Sheffield, are turning their extensive shell shops into steel foundries and rolling mills; Cammell, Laird & Co., Ltd., Sheffield, are carrying out similar arrangements and modernizing their plants. At their Birkenhead works, large numbers of new tools are being installed, and their large Nottingham factory is being reorganized for peace production. These examples are typical of many others.

The manufacture of the new equipment required in such changes greatly stimulates not only machine tool making, but allied industries as well. Such concerns as Davey Bros., Sheffield, and Henry Berry & Co., Leeds, and other press and rolling mill makers are extremely busy. The Birmingham brass and associated trades, which have in many cases been practically closed down during the war, are now starting up, and the same general conditions apply.

Magnetos, Spark Plugs, Etc.

An unusual development has taken place during the war in the manufacture of magnetos, spark plugs and other accessories such as were previously imported. Prior to the war the Bosch magneto, a German product, practically held the field by means of the highly specialized manufacturing methods adopted, resulting in an inexpensive article with which competition was difficult. The increased war demand and the cessation of German supplies brought a number of manufacturers into the field who have since combined under the title of "British Ignition Apparatus Association," with the result that foreign competition is likely to be rendered difficult in the future. There is no Sherman Law in Great Britain.

The names of the firms in the association are: C. A. Vandervell & Co., Acton Vale, London; North & Sons, Ltd., Watford; the Thomson-Bennett Co., Coventry; P. N. L. Magneto Syndicate, Ltd., Coventry; Electrical Ignition Co., Ltd., Birmingham; British L. M. Ericsson Mfg. Co., Ltd., Beeston, Notts; British Thomson-Houston Co., Ltd., Coventry and Willesden; British Westinghouse Electric & Mfg. Co., Trafford Park, Manchester. Other concerns outside the association, including Vickers, Ltd., London, are also manufacturing magnetos.

Jigs and Fixtures

Particular activity is shown in jig production, the demand for jigs and fixtures far exceeding the capacity of the tool-rooms of the individual plants. A number of small concerns have entered the field to supply this demand, and some of the larger firms, such as W. Beardmore & Co., Glasgow, and W. H. Allen & Co., Bedford, have built extensions or departments for the

exclusive manufacture of jigs, fixtures, gages and special tools from customers' own designs.

Small Tools

The brisk demand for small tools has led to an increase of about 60 per cent in the number of persons engaged in this trade since 1914. Permanent additions to the lines of concerns since 1914 may be itemized as follows: Self-opening die-heads, screw gages, taps and dies, self-centering chucks, belt lacing tools, tool stands, twist drills, micrometers and slip gages, tool-holders, center drills and countersinks.

Die-Casting and Extrusion

Die-casting and extrusion manufacturers were very busy during the war, but there is a need for improved machinery for die-casting, particularly in aluminum and brass, British machines for this work generally being somewhat primitive.

Statistics of the Machine Tool Industry

It is difficult to arrive at anything more than an approximate estimate of the number of work people engaged in the British machine tool industry. The classification adopted in the statistical tables published in the *Labor Gazette*, which is the organ of the Ministry of Labor, is a broad one, all the engineering trades being aggregated and subdivided in respect to districts, but the machine tool industry is not given separately. The approximate number of shops is about 200, and figures which I have obtained and have had verified by authorities show a total of about 26,000 workmen in 1914 as against 32,000 in 1919. The above figures do not include concerns making forge and blacksmith shop, patternmaking and foundry tools, heat-treatment furnaces and small tools and accessories. This group will number 100 concerns at least, and approximately 6000 workmen were employed in 1914, which number has been increased in 1919 to at least 7500.

Control of Imports

There is at present no restriction in, nor governmental control of, the imports of machine tools and kindred products, nor is any license required to import them. The only limitation is the amount of shipping space available from America. Some Americans take an erroneous view of our favorable trade balance and the enormous sums due us from Europe; but a moment's thought will show that these favorable balances, adverse to Europe, are a handicap rather than a stimulus to our export trade because the present demoralized exchange rate represents an increased cost to British importers of over 10 per cent on American products.

Classes of Tools in Demand

Dealers report a steady and general demand for high-class tools, except automatics, which show a slight decrease owing to the disbanding of the Government fuse factories which set free a large number of these machines. A good demand should continue for small (12- to 14-in.) and medium (17-in. and upward) high class engine lathes, turret lathes, grinding machines, broaching machines, heavy duty and multiple drilling machines, milling machines, gear cutters, automatic screw machines, die-casting machines, chucking machines, precision bench lathes, machinists' small tools, and particularly tools adapted to the economical production of such parts as automobile engine cylinders, gears, back axles, connecting rods, etc.

Government Sales of Machine Tools

British government sales of machine tools are being conducted so as to disturb the market as little as possible. Prices rule uniformly high in the case of standard tools, and the last sale produced about £150,000. A new method was adopted—that of overhauling each second-hand machine before it was offered and putting it in such a condition as to render it immediately available for work. In this way the Government obtained the benefit of what is known as the "immediate delivery premium," which more than repaid the money expended in overhauling the machines. The government policy on

the tariff question is unknown, but an announcement is expected in September. Public opinion on the question is divided. One side, represented by users and merchants and certain makers, is that a duty on imported tools would be a great disadvantage to British industry and a check to progress; on the other side, makers ask why machine tools should come into their country free if they have to meet a duty against them in foreign countries, meaning America. Most of the old protection and anti-protection arguments which we are accustomed to in America are being made use of. The writer's opinion is that the question involves so many conflicting interests that no practical working policy can be decided on by September. British makers at present cannot begin to meet the demand for certain kinds of machines produced in the United States, such as automatics, broaching machines, multiple-spindle drilling machines, vertical surface grinders, and bench precision lathes, and they will continue to buy them there; while the demand for cylindrical and internal grinding machines and high-class engine lathes is considerable.

A national desire has developed in Great Britain to manufacture machine tools, as well as everything used or consumed in the country; and this feeling has been emphasized by the unfavorable exchange rate which prevails, the pound sterling selling almost as low as at any period of the war.

While there is the utmost good feeling on the part of the British toward America, the tendency is strong to place orders for all kinds of machinery at home, even at a somewhat higher price, if the machines are made here. Two large orders for railway equipment, one for India and the other for Canada, I am informed, have

nounced to meet the increased costs consequent upon the payment of the higher wage rate, the forthcoming reduction of hours to seven per day shift, and the consequent lessened output, has been deferred. The postponement is due largely to the prompt admission of the seriousness of the position by the miners themselves and to the realization that there exists other checks to output besides the cause above mentioned, such as the shortage of cars and materials. The whole situation is to be dealt with by the cooperative effort of the Government, colliery owners and miners. The opinion is expressed that American coal will be offered in the London market. It is stated here that American coal is being offered f.o.b. at Atlantic ports at 20s per ton, but the lowest price for American coal in European ports is stated to be 130s per ton; that is, the freight and handling costs 110s. a ton.

Remuneration of Work People

In 1914 the average wage of a turner (machinist) was from 34s to 39s per week according to district, as against from £3 12s 0d to £3 15s 0d per week in 1919; that is about 100 per cent. In addition to this increase in wages, the weekly hours have been reduced from 53 or 54 to 47, and a further reduction to 44 is being considered. The current wages at time rates:

Basic wage (Midlands).....	£2	6s.	0d.
War advance	1	1	6
Special bonus of 12½ per cent.....	8		4
	£3	15s.	10d.

For men employed on piece work, a general minimum advance of 10 per cent on pre-war rates, plus 21s 6d per week, has been adopted in the federated machine shops throughout the country. The following table shows the average amount of increase (inclusive of the 12½ per cent bonus) granted up to the end of April, 1919, on the district time rates for men in certain representative occupations in a number of the principal machine centers, and the equivalent percentage increases over the pre-war rates:

Occupation	Amount of increase per week	Percentage increase on pre-war rates, per week
Machinists	37s. 11d.	98
Molders	38 2	92
Laborers	35 5	156

For women in the machinery industry, 18 years and over, not engaged on men's work, the present minimum, including 16s war advance, is 38s per week. Higher rates are paid to women engaged on men's work, and to those employed on certain special classes of work.

Remuneration of work people in the machine tool industry is largely by piece-rate, the operators being allowed to make a total as large as they can in a week's work. Although in general the attitude on the part of the men toward the premium and bonus system is not sympathetic, some machine tool concerns have adopted it successfully. In one plant all the work is done on that basis, a standard amount of time being allowed for each operation; the difference between the standard time allowed and the time taken is equally divided between the firm and the workman. Standard time allowances are determined by the departmental foremen, who actually do or watch each of the operations under working conditions. Once set, the standard time is never cut, no matter how much the operator may earn. The firm in question believes that rate cutting on piece work is not only unfair but demoralizing and that the best way, if a mistake has been made in the rate, is to stand by it.

Profit Sharing Plans

Profit sharing plans are attracting attention and one in particular, which has been adopted in several plants, is held by some to offer the promise of a solution of one of the most difficult industrial problems. It is based first on the provision of a standard wage plus a further interest based upon the selling price of the product. In the case of a lathe plant, where the system has been adopted, a careful investigation of the books for many years back has shown that the cost of ma-

Prices of British Machine Tools in 1914 and 1919

Class of Machine	Price in 1914	Price in 1919
14-in. shaper	£70	£157
Horizontal boring, facing and milling machine. 290		710
20-in. single tool grinder.....	22	39
Metal band-sawing machine.....	130	214
Hydraulic press	500	1000
Double-end punching and shearing machine... 168		386
20-in. engine lathe, Lancashire built, good class 200		420
20-in. lathe	90	180
12-in. lathe, cheap line.....	26	52
16-in. engine lathe.....	120	235
17-in. lathe, Yorkshire type, manufacturing... 56		92
17-in. lathe, Yorkshire type, manufacturing... 65		140
19-in. lathe, Yorkshire type, manufacturing... 60		130
Planing machine	180	240
13-in. turret lathe.....	140	230
8 x 3 x 3 ft. planing machine.....	245	590
30-in. boring mill.....	200	270
Hacksawing machine	21	31
9-in. slotter	100	196
10-in. slotting machine.....	80	160
Hand screw machine	58	100
Horizontal boring machine.....	360	576
Universal tool and cutter grinder.....	65	94
48-in. radial drill.....	95	200
Combination turret lathe.....	300	480

Prices of Material, 1914 and 1919

Material	July 1914 per ton	June 1919 per ton
Mild steel bars	£6 5s. 0d.	£19 0s. 0d.
Copper	61 2 6	84 10 0
Iron (crown bars) N. E. coast and Lancashire	6 12 6	20 10 0
Pig Iron, No. 1 foundry (Cleveland) 2 14 0		8 10 0
Steam coal—Best Hards	10 3	1 2 6
Seconds—Best Hards	9 6	1 1 6
Slacks—Best Hards	6 3	18 3

lately been placed in Great Britain at prices higher than American manufacturers offered, although all British locomotive works are behind in their deliveries, one being said to be eighteen months behind. All the railroads here build their own locomotives, the independent manufacturers making principally for export.

Increase in Selling Prices

The accompanying table exhibits roughly the average increase in the 1919 selling price of certain classes of British tools. The average increase is 97 per cent.

The increase of 6s per ton of coal that was an-

trial represents at least one-third of the selling price of the finished machine; another third, it is reckoned, should rank as wages; and the remaining third is for overhead charges, interest on capital, selling and any other miscellaneous expenses. This agreement starts with the declaration that the standard rate of wages is to be maintained and that each month any balance remaining from one-third of the total selling prices for the period is to be divided among the workers in proportion to the time worked and the standard wage of each workman and apprentice.

It is claimed that this system encourages the introduction of new machinery, for any increase in production is bound to benefit the worker, while any new machinery made by the firm for its own use is credited to the bonus fund on the basis of its market value. Attention to work and full time are encouraged by the substantial inducements held out, while laxity, if penalized, is not unfairly dealt with. Any workman absent more than 15 hours in one month, unless for a valid reason, forfeits 10 per cent of his accrued bonus. To check any tendency to rush out goods regardless of quality or finish, provision is made that in the event of any legitimate complaint from a customer on account of defective workmanship in machines made by the firm, which defective workmanship has to be made good, the cost of wages for such substitution on repair is to be borne out of the current month's bonus fund, while any cost of material is borne by the firm. A committee of three has been appointed by the workmen to discuss any improvements in production and conditions of employment.

The question, often asked by American manufacturers as to the relative productive capacity of the British and American workmen in the machine tool industries, it is impossible to answer accurately without detailed comparisons of actual production. The observation of those who are familiar with conditions in the two countries agree that the general comparison favors our workmen to quite a large extent.

Prices of Food and Other Commodities

The all-around increase in the price of food since 1914 is well over 100 per cent. For example, the price of flour and bread has doubled, bacon and imported mutton have trebled, and sugar and lard have quadrupled in Great Britain. Clothing costs three times the 1914 price with a still rising tendency. Traveling costs are up 50 per cent. Good quality house coal, which was 28s per ton in 1914, is now 52s 6d. Gas and electric light have increased correspondingly. The rents of working men's dwellings have, by reason of the control, remained about where they were in 1914, but when the control is lifted, as it will be in a few months, rents will increase as is evidenced by the increased purchase price of house property.

Labor Conditions and Employment

A great deal of unemployment exists, particularly in the big munition centers, such as Sheffield, Birmingham and Manchester. The men there are, however, largely unskilled, who have been drawn into the machinery of industry by the war. Skilled men are scarce, and owing to this shortage and other causes referred to the progress of reconstruction is retarded.

The total number of unemployed persons on May 2, according to the donation records, was 1,093,400 as compared with 1,060,245 on March 28, an increase of 33,155. The total of 1,093,400 was made up of 402,151 men and 1,316 women demobilized from the army and navy service, and 689,933 civilians. Of the latter, 452,132 were women and girls. An analysis of 1,082,759 of the applications made up to May 2 revealed that 63,930 of the unemployed persons were in receipt of the reduced donation which is paid to civilians after the expiration of the first period of 13 weeks' unemployment; of this number nearly two-thirds were women. The number of men on the live registers of the employment exchanges on May 9 was 653,270, an increase of 87,902 over March 28, and the number of women was 450,155, a decrease from March 28 of 113,035 on the total. The number of vacancies unfilled on May 9 was 44,211 for men and 62,369 for women,

the corresponding figures for March 28 being 46,591 and 65,145. Trade unions with a net membership of 1,202,793, excluding those serving with the forces, reported 2.8 per cent of their members as unemployed at the end of April as compared with 2.9 per cent at the end of March, and 0.9 per cent a year ago. The unemployment pay for civilians is at present £1 a week for 13 weeks. No figures can be given for the period following this period, as the pay varies considerably according to the individual's responsibility. For soldiers who have been demobilized since November last the pay is £1 9s a week for 13 weeks, after that period the same amount is paid as to civilians.

Great apprehension exists in industrial circles over the attitude and requirements of labor, and the resulting uncertainty is paralyzing industrial development. There is no industry or occupation in which stable labor conditions exist. When their labor troubles are settled, British manufacturers expect to see the greatest trade revival of this generation; but if they continue for any considerable period, it is felt that British markets will pass in a large measure to competing countries where such troubles do not exist.

Many Youngstown Mills Operating to Almost Full Capacity

YOUNGSTOWN, OHIO, Aug. 26.—With the exception of blast furnaces and coke ovens, operations suspended Aug. 23 at the Republic Iron & Steel Co., when employees attended the annual outing of the Relief Association. More than 7000 attended.

Steady influx of orders for all kinds of semi-finished material and finished products insures steady schedules for the rest of the year. In fact, some mills are refusing to take on additional business.

It was expected to get Anna furnace of the Struthers Furnace Co., Cleveland, in operation last week, but a wire reached Manager L. S. Baldwin instructing him to hold off lighting the stack. It is a 500-ton merchant furnace, located at Struthers, Mahoning County, and has been entirely overhauled and repaired.

All companies are operating their plants near 100 per cent in most departments. Labor Day there will be the usual layoffs. Employees of the Youngstown Sheet & Tube Co. and Brier Hill Steel Co. will participate in their annual outings, for which elaborate programs have been arranged.

Inability to get full crews in sheet mills has retarded these schedules.

Steel for Railroad Springs and Tires

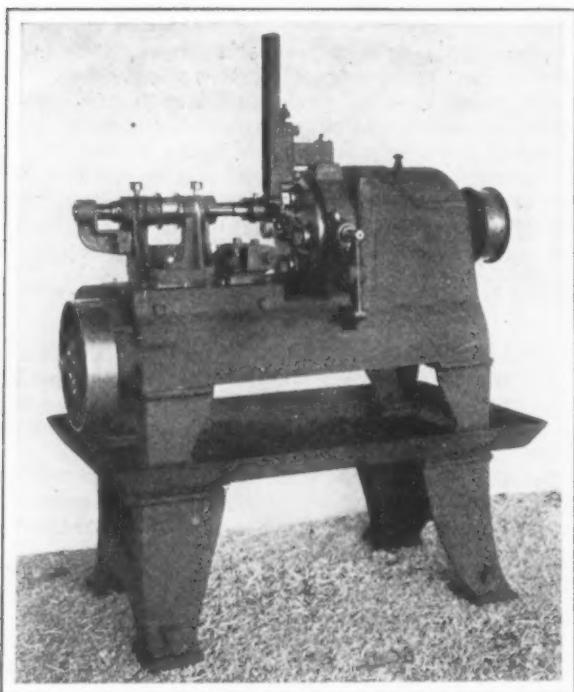
The subject of springs and tires for railroad cars was touched upon in a recent paper by Dr. Hatfield before the Institution of Mechanical Engineers, entitled "The Mechanical Properties of Steel." With regard to springs, he stated these had to withstand considerable elastic deformation and reversal of stress, including shock, for indefinite periods. Experience had resulted in quite a hard steel being employed with a high maximum stress, yield and elastic limit and with relatively little ductility. As to tires, it was found that success was attained by using a somewhat high-carbon steel, or one with a pearlite matrix. This resulted in a relatively high maximum stress with a correspondingly wide elastic range. The most excellent tires which have proved extremely efficient in service had, under the notched bar test, a low notched impact value. The drop test was employed in passing tires, and it occasionally happened that a tire would fail under this test. It was an astonishing fact that in some cases those which failed had a higher notched impact value than those which withstood the specified test.

The Sheet Metal and Slag Roofing Contractors' Association of Baltimore, Inc., 29 South Howard Street, Baltimore, has been incorporated without capital stock for the purpose of mutual aid and protection for those engaged in these businesses. The incorporators are John Kunzleman, George E. Phillip and Charles E. Parsons.

1/2-In. Nut Semi-Finishing Machine

The Kent Machine Co., Kent, Ohio, is placing on the market a nut semi-finishing machine designed for accuracy of work and speed in production. The capacity of the machine is for nuts up to 1/2-in. size. The machine is a four-station horizontal turret type with hand-loaded magazine feed.

At the first turret the nut is taken from the feed and screwed on the revolving spindle. In the second turret station the roughing semi-finishing cut is taken. The third station is used for the finishing cut, while at the last the nut is automatically removed. As it is



A High-Speed Four-Station Horizontal Turret-Type Machine for Semi-Finishing Nuts

revolved upon its own axis the chamber is essentially concentric with the axis of the screw thread, thereby, it is stated, making the work exceedingly accurate. According to the maker, exceedingly large production which may be obtained for the reason that there is no starting or stopping of the turret spindles.

The turret spindles are made of nickel steel and run in tapered adjustable bearings made of special alloy bronze. All gears in the turret head are made of steel and are well enclosed. The complete machine weighs about 3000 lb., and is designed to run at high speeds with metal so placed as to absorb any shock or vibration due to cutting action or the cam mechanism.

Youngstown Mills Withdraw from Market

YOUNGSTOWN, OHIO, Aug. 26.—With valley finishing mills booked in most cases for the rest of the year, a decided contrast is presented over conditions which prevailed two months ago. At that time, sales departments were in keen competition for orders and specifications were carefully scanned and followed up, though the beginning of the trade boom was looming. Now some companies have withdrawn from the market. The Trumbull Steel Co. at Warren, Ohio is out of the market for tin plate for the remainder of the year; the Republic Iron & Steel Co. has withdrawn from the sheet-bar market and is out of the market for its principal finished products; the leading sheet producers are still negotiating business, but are booked from seven to eight weeks. During the past two weeks, they have turned away orders which aggregated substantial tonnages because of inability to meet deliveries. Prices are remaining at the same levels in spite of this condition. A conspicuous feature of the market is the business placed by jobbers and brokers, who several months ago refused to buy except against immediate

requirements of their clientele, anticipating lower prices. Considerable demand has sprung up for blue annealed sheets, chiefly from the enameling industry. The principal maker of hot and cold-rolled strip steel is temporarily out of the market, capacity output being booked for the rest of the year.

A sale of 18,000 tons of sheet bars is reported. Shapes and forms are in heavy demand. The plate market is feeling the stimulus of the trade in general and rolling schedules have been accelerated. Wire mills are covered over the fourth quarter, orders including large tonnages for wire fence for South America. Unless threatened labor troubles conflict, the steel industry faces a long period of prosperity, district manufacturers are certain.

American Institute of Mining and Metallurgical Engineers

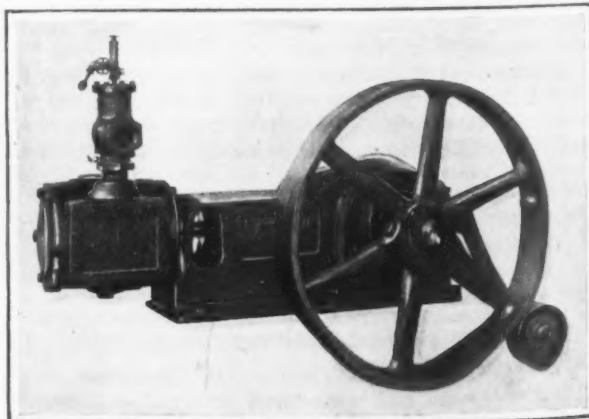
In view of the large number of coal mines centered about Chicago it is planned to make the Chicago meeting, to be held at the Congress Hotel, Sept. 22-26, of especial interest to the coal industry. A large proportion of the 150 technical papers prepared for discussion will be on subjects related to coal, coal mining and coke. Among these is a carefully prepared symposium on sulphur in coal.

Metallurgists and electrical engineers will be much interested in the demonstration to be made of the production of metallic tungsten and molybdenum at the plant of the Fansteel Products Co., North Chicago, on Tuesday, Sept. 26. As a part of the program for the Chicago meeting an excursion has been arranged to Milwaukee to visit the various mining machinery plants in the vicinity, and a stop will be made en route at the Fansteel plant. The entire metallurgical process will be shown, from the preparation and purification of the commercial concentrates, and including sintering the pulverulent metal obtained into homogeneous billets by the use of currents of enormously high amperage.

New Small Air Compressor

The small air compressor illustrated is a recent product of the Laidlaw works of the Worthington Pump & Machinery Corporation, Cincinnati. This compressor was designed primarily to fill the needs of the small user of compressed air. It is of the single-cylinder type, 7 1/2 in. x 6 in., and can be furnished either steam driven or belt driven. The piston displacement is 100 cu. ft. per min., and develops pressures up to 125 lb.

The air valves in the compressor are of the Laidlaw feather type, the same as used on large compressors, and weigh only 1 1/2 oz. each. The running gear is com-



Small Capacity Air Compressor with Air Valves of Laidlaw Type

pletely inclosed, is self-oiling and dustproof, and the bearings and all working parts run in oil. It is claimed that the main bearing design represents a complete departure from the usual practice, inasmuch as the bearing assembly is a unit by itself and may be completely removed from the main frame casting for refitting or repair.

Iron and Steel Prices During the War

Bulletin of War Industries Board Shows Fluctuations and Discusses Price-Fixing Policy of the Government, Whose Effectiveness Is Commended

A HISTORY of iron, steel and their products by Walter W. Stewart has been issued by the War Industries Board, Washington, as Bulletin No. 33, which is one of 50 similar studies of war-time prices in different industries. The aim of all these studies is to make the price quotations gathered by various Government agencies available to men concerned with problems of business readjustment and also to provide a permanent record of the great revolution in prices that accompanied the world war. A history of prices during the war is given, repeating much of the information published in THE IRON AGE of Jan. 2, 1919, but in somewhat different form. For example, a summary statement of the relative prices prevailing at certain significant dates is presented in the following table:

	July, 1915	April, 1917	July, 1917	Oct., 1918
Iron ore, Mesabi, non-Bessemer...	85	153	153	174
Coke, Connellsville, furnace	85	352	594	291
Pig iron, basic	96	291	394	240
Steel billets, open-hearth	103	344	436	218
Structural shapes	98	260	424	205
Steel plates, tank	97	357	714	258
Tin plate, domestic, coke	92	233	349	225
Wire rods, Bessemer	102	337	382	226

The advance in prices caused by the entry of the United States into the war is shown by the rise from April, 1917, to July, 1917. In July the first announcements of a Government price-fixing policy were made, and the October prices show the reductions accomplished through price control. The average of market prices from July 1, 1913, to June 30, 1914, is taken as 100.

The relative movement of pig iron production, reduced to the same base as the price relatives, is presented in the following table. The average monthly production from July, 1913, to June, 1914, was 2,231,420 gross tons; this figure is taken as 100.

	1913	1914	1915	1916	1917	1918
January	125	84	72	143	141	108
February	116	85	75	138	119	104
March	124	105	92	150	146	144
April	123	102	95	145	149	147
May	126	94	101	151	153	154
June	118	86	107	144	147	149
July	115	88	115	145	150	153
August	114	89	125	144	146	152
September	112	84	128	144	140	153
October	114	80	140	157	148	156
November	100	68	136	148	144	150
December	89	68	144	142	129	154

Index Number of Iron and Steel Prices

To show the general trend of prices in the iron and steel industry, an "index number" has been constructed. Particular prices undergo such widely diverse fluctuations that it is necessary to average them in order to give a clear impression of their general movement. Such an average, if it is to be useful, must have some regard for the relative importance of the different commodities. Therefore, each commodity is "weighted" by multiplying the monthly prices from 1913 to 1918 by the amount of the commodity produced in 1917, plus imports. The year 1917 is used as the weighting year because the index number is intended to reflect wartime conditions, and because 1918 data were not obtainable when this bulletin was written.

An enumeration of the successive steps in making these index numbers will show what the figures mean. First, for every commodity included in the computation, there was made an estimate of the quantity produced in the United States in 1917, plus the quantity imported. Second, the price of the commodity in each month in the six-year period covered was multiplied by the "weight." Third, the products of the different commodity prices times their weights were added up separately for each month. Finally, the monthly aggregates were turned into relatives on the pre-war base; that is, the average aggregates of July, 1913, to June, 1914, were made equal to 100, and all the monthly aggregates were made over on that scale.

The advantage of this last step in the computation, by which the aggregates are turned into relatives, is that the index shows readily the movement of prices away from the pre-war level. The index is thus adapted to the main purpose of the inquiry—to show the effect of the war on prices. The actual prices of particular commodities, when turned into relatives on the same pre-war base, are comparable with this index for the general trend. The relative movement of basic pig iron prices, for example, can be compared in this way with the general movement of all iron and steel prices. These movements are graphically shown by charts drawn to a uniform scale. On this plan all the price charts presented are strictly comparable with one another.

To make the index number for all iron and steel prices, a total of 88 different series of quotations are combined. These 88 series are also separated into two groups, and for each group another index number is constructed. The first group consists of 30 series for either raw materials or slightly manufactured products, and the second group consists of 58 series for the more highly manufactured products. These two index numbers show the differences between the price movements of the simpler products and those which are the outcome of the more advanced stages of manufacture. The method used in constructing these index numbers is the same as that described for making the index for whole class. In fact, the price aggregates for each of these groups are merely subtotals of the class aggregate.

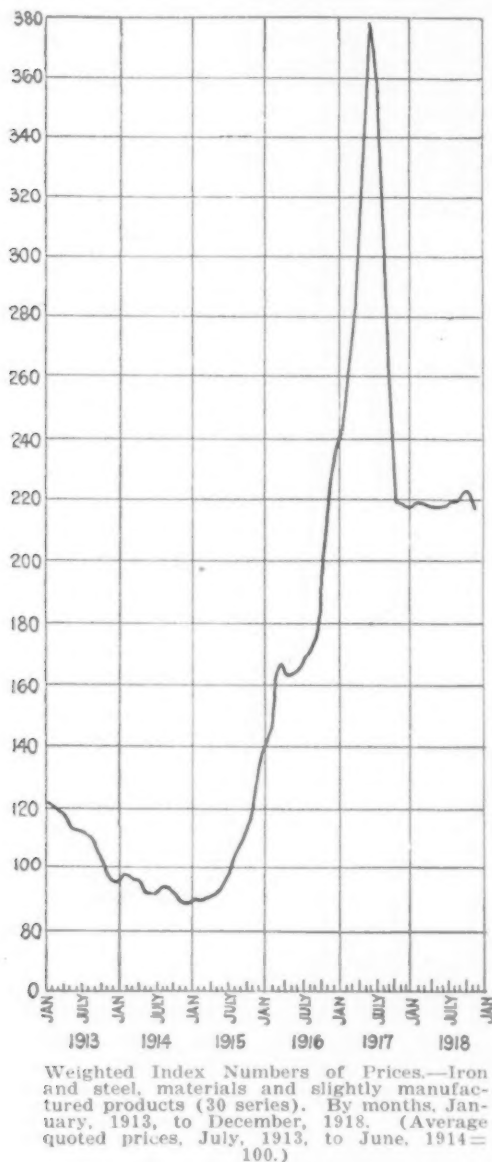
The price movement of the more highly manufactured goods is shown by the index number for those commodities, which affords a striking contrast to the price index for other iron and steel products. The prices of these more highly manufactured goods increased steadily throughout the period; they did not increase in the same degree as did the prices of simpler products; they did not reflect the decrease in the prices of raw materials brought about by price fixing. Fluctuations in the costs of materials have less influence on the prices of the more elaborate products than upon the prices of the simpler rolled products. According to the Census of Manufactures for 1914, the cost of materials constituted only 32 per cent of the value of the products of the cutlery and edge-tool industry, for example; while in the steel works and rolling mills the cost of materials constituted 64 per cent of the value of the products. A reduction in the price of materials, therefore, could not be expected to bring about equivalent reductions in the prices of the more elaborate products. Also, even though prices were reduced, the materials were not available for the production of many goods, because the steel was being conserved to meet war needs. Finally, the steady increase in the prices of the more highly manufactured goods shows the influence of the increase in wages, which continued to rise after the decrease in the prices of raw materials.

One further factor affecting the steel market in war time is the peculiar character of the demand. The fundamental difference between the attitude of the Government and that of the ordinary purchasers of steel makes possible a rise in prices which could not come about under the usual business conditions of peace time. Buyers of steel in times of peace expect to realize a profit on their investment; the steel that goes into buildings and bridges must be bought at prices which will make possible satisfactory returns. If these buyers believe prices are likely to decline in the near future they withdraw from the market. Their attitude serves as an effective check on buying when prices have reached what is considered an abnormal level. The attitude of the Government toward its war-time purchases, however, differed fundamentally from this; it bought with no expectation of earning a return; the possibility

of lower prices in the future did not check its buying. The absence of the investor's attitude in Government buying removed the customary upper limit to price fluctuations, and the urgency of the demand caused an extreme rise in prices.

Price Fixing in Iron and Steel

The control exercised by the Government over iron and steel prices had so important an influence on the



course of the market that the character and consequences of the policy are to be considered at length. This subject has been fully covered by THE IRON AGE, but the bulletin will be found of value for reference by those especially interested. The bulletin says:

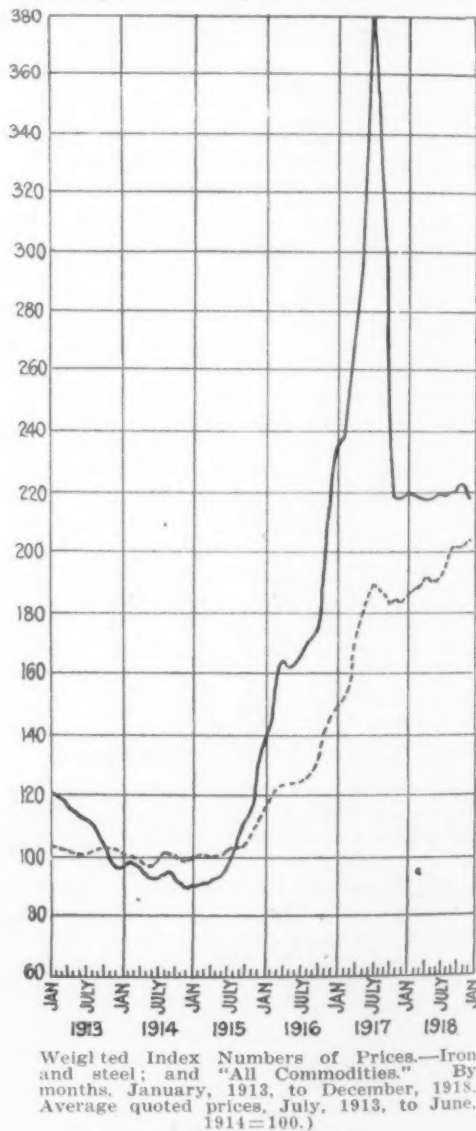
"As part of the policy of price fixing, safeguards were provided against certain commonly-predicted evil consequences that were to follow regulation. Fears had been expressed that production would not be maintained when prices were reduced; that producers would protect their profits by reducing wages and so cause labor unrest; and that charges of unjust discrimination would be made by the public and the Allies if the Government bought steel at less than the prices they were paying. As part of the agreement, therefore, the producers pledged themselves to maintain production; not to reduce wages; and to sell to the Government, the public, and the Allies at the same prices.

"The character of the market situation immediately preceding price fixing must be borne in mind in considering the effectiveness of price regulation of iron and steel. The quantity of steel available in the market was small; mill capacity had been sold up for months ahead; and market prices reflected the scramble to secure the unpledged output. These prices charged to the late comers bore no relation to cost of produc-

tion. Current deliveries on long-time contracts were at prices much less than those in the open market, though large premiums were paid for prompt shipments. The Government was unable to buy at uniform prices but was letting contracts at the same time for the same material at different figures. The situation had become intolerable; as a satisfactory means of determining prices the uncontrolled market had failed.

"The effectiveness of price fixing in remedying some of these evils can not be questioned. Confronted with the situation as it existed in the middle of 1917, price fixing was a wiser expedient than any of the suggested alternatives. It was more direct and more economical than paying the market price and trusting to the excess-profits tax to bring back to the treasury the extraordinary profits. It was simpler as a matter of administration, and in closer accord with the general policy of the Government than the commandeering of the steel plants. The policy succeeded in bringing about substantial reductions, in giving uniformity to prices, and in stabilizing the market. The control was so effective that in looking back upon the experience the only regret is that the control was not exercised at an earlier date.

"Those responsible for price fixing never formulated



fully the principles underlying their action, and it may be doubted if they were guided by any single principle. The attention given to costs of production in their investigation and conferences, however, indicates the point of view from which they worked and some of the determining considerations. The theory of price fixing implied in their regulations was that the principles of a competitive market should be applied to a market situation in which those principles no longer prevailed. The faith that an uncontrolled market will give "fair prices" rests on the belief that competition will keep prices in a close relation to costs of production. When the conditions of demand are such as to destroy this

relation between prices and costs, as they were during the war, unfair prices and unreasonable profits result. It was a matter of keeping the faith, therefore, to apply to prices through price-fixing agencies the same principles which the market would have worked out under normal conditions."

Sources of Information

The bulletin states that in the description of the general characteristics of the iron and steel industry,

use was made of the Report of the Commissioner of Corporations on the Steel Industry of 1913. The chief sources of information concerning the course of the market during the war were THE IRON AGE and the *Steel and Metal Digest*. The sources of price data are indicated in the descriptions of the commodities. The reports of the American Iron and Steel Institute, the Summary of the Bureau of Foreign and Domestic Commerce, and the Census of Manufactures for 1914 were used in preparing the production data and the weights.

Tungsten, Vanadium and Manganese During War

Domestic Production—The Strong Demand for Tungsten—Price Fluctuations

BULLETIN No. 34, published by the War Industries Board, is also one of a series on the history of prices of various commodities during the war. This one covers ferroalloys, nonferrous and rare metals, and was compiled by H. R. Aldrich and Jacob Schmuckler. It covers 92 pages. An abstract of the data relating to ferrovanadium, ferromanganese, spiegeleisen, manganese ore and tungsten follows:

Ferrovanadium

No statistics are available showing the production of the alloy, and it is proposed to calculate the volume of trade for purposes of this study from the best available statistics of vanadium supply in terms of metallic content of ore and concentrates produced.

Domestic Production of Vanadium—Metal in Ore and Concentrates

Year	Quantity, Tons	Year	Quantity, Tons
1913.....	432	1916.....	*550
1914.....	452	1917.....	*550
1915.....	627	1918.....	*220

*Estimated.

Little information is available concerning the minor fluctuations in the price of ferrovanadium. The supply in this country is limited and controlled by a few companies. To a degree the supply is dependent upon imported ores, and the only considerable foreign source is also under control of one company. The effect of these imports upon the price of the alloy is, therefore, probably not great. The steady upward trend of market prices is undoubtedly a reflection of the steady demand for special steels and hence for vanadium. Supply was less than demand. Prices were allowed to advance in the hope of stimulating production. In 1918 the advance reached unusually high levels because of a scarcity and even threatened shortage. England was being supplied about 50 tons per month, although she asked for 100 tons. Because of the inaccessibility of the Peruvian mines, and also because of the shipping situation, there was no way of increasing the supply except by stimulating American production, and this was very expensive. The saving feature was the fact that at this time there were considerable stocks upon which to draw. All non-essential consumption was prohibited. At the time the armistice was signed a new source which gave considerable promise was reported to have been found in Peru. This was an asphaltum which, when burned, gave an ash said to contain from 15 to 20 per cent of vanadic oxide.

[The bulletin in its tables gives the base price for 1913 as \$2.21 per lb. of contained vanadium, for 1914 as \$2.29 per lb., for 1915 as \$2.30 per lb., for 1916 as \$2.57 per lb., for 1917 as \$2.79 per lb., and for 1918 as \$4.76 per lb., with \$5.50 per lb. ruling in December, 1918.]

Ferromanganese

At the beginning of 1913 the market for ferromanganese was at the highest point since 1907. The general trend of prices during the year, however, was downward. The real cause of this persistent decline is not known.

In 1914 for seven months prices were the lowest of the six years. But with the outbreak of the war prices jumped from \$37.50 to \$100 per ton. The fear of an embargo on exports from England was undoubtedly a

factor in this sudden rise, but greater confidence in the continuation of supplies led to a relaxation in price which dropped during September, October and November. In December the advance started again and by February, 1915, regained the level of \$100 reached in August, 1914. This level was maintained until June, when a slight increase was experienced. In September a new maximum was set at \$110 per ton, but the following months saw a return to \$100.

The 1916 prices showed wide fluctuations for which the shipping situation was largely responsible. At the beginning of the year there was a domestic scarcity, and because of the scarcity of ships it was impossible to import quantities sufficient to hold prices in check. In the first quarter the situation grew more acute, but in April and in May several large cargoes arrived and prices fell gradually. In July conditions were nearer normal, and from then until the end of the year prices dropped somewhat. The 1917 market saw a progressive advance to \$400 in June and July. This was the most rapid and extensive rise of the war period. The price dropped again during the last half of the year to \$247.50.

In 1918, however, the level was constantly at \$250. In May the standard for ferromanganese was reduced from an 80 to a 70 per cent grade. Therefore, while the price quoted was constant at \$250 per ton, the decrease in grade really meant an increase of \$0.446 per unit or \$44.60 per ton. March, 1918, was a critical month. At the time we were relying almost entirely upon imports of high-grade ores from Brazil, but because of a shortage of coal in Brazil the only railroad bringing ore from the mines to the seaboard was shut down. The authorities in Washington immediately took the matter in hand, and coal was shipped to Brazil to safeguard the supply of ore from this source. About this time the Government ship Cyclops, bearing a large and much-needed cargo of manganese ore, disappeared while en route to this country. The situation was saved at this time by the licensing of about 12,000 tons for import from England.

At no time was the price of ferromanganese fixed. In May, 1918, the American Iron and Steel Institute attempted to stabilize the market, which tended to fluctuate with the tonnage of the imports that happened to come in, by arranging a schedule of prices for manganese ore produced in the United States. This schedule stipulated an increase in prices to ore producers, and by stabilizing the price over a period of one year, made the producers confident of the market and encouraged them to increase their output.

Spiegeleisen

In general the price level of spiegeleisen follows that of ferromanganese, although since the former carries a much larger percentage of iron, the price of iron affects the market for spiegeleisen more than that for ferromanganese. The highest prices commanded by spiegeleisen came in 1917. The advance in 1914 and 1915 was at first slow. It became rapid in 1916 and 1917. The effect of the outbreak of the war on the market prices of manganese was clearly shown in the case of ferromanganese. It was necessary to interpolate prices for spiegeleisen during 1913 and 1914, and in making the calculations the ferromanganese curve was closely followed. The sharp advance shown

in the price tabulation is therefore entirely artificial, but is believed to represent closely the change taking place.

Manganese Ore

The effect of the war on the price of manganese ores is reflected in an advance of 2c. per unit in August, 1914. Throughout 1913 the contract price remained absolutely constant, and, for that matter, the drop of 1c. in February, 1914, was maintained constant for six months.

The level found in August, 1914, persisted throughout the 12 succeeding months. An advance of 19c. per unit was made in August, 1915. It is to be noted that these are contract prices and changes in level are abrupt. Again the price held firm until August, 1916, when another advance of 10c. was made. The growth of steel production was of necessity accompanied by increasing consumption of manganese, for each ton of steel requires from 15 to 20 lb. of manganese. The increasing demand brought a revision of schedules in March, 1917, when prices advanced to 80c. per unit, an increase of 25c., and again in May, when the quotation reached \$1 per unit.

Thus, from August, 1915, to May, 1917, prices for manganese ores advanced from 26c. to \$1, or practically 300 per cent in 22 months. The maximum had not been attained, however, for by October, 1918, the price advanced by sharp rises at frequent intervals to \$1.25.

In May, 1918, the American Iron and Steel Institute arranged a schedule of prices for manganese ores produced in the United States, and the market was greatly stabilized. Prior to that time the price fluctuated widely with the amount of imported ore arriving each month. With this schedule in effect, producers were guaranteed a price to stimulate production. Until the signing of the armistice this schedule was adhered to in the purchase of American ores. From then until the end of the year, in consequence of the retarding effect of the cessation of war on the activities of the steel industry, a much lower price prevailed.

Tungsten

No feature of the steel industry is more remarkable than the development of high-speed cutting-tool steel. The growth was greatly stimulated by the war, when plants of all sorts were equipped for heavy machine work on shells and guns. To illustrate, in 1913 about 2000 tons of 6 per cent concentrate was consumed, while by 1916 consumption jumped to 9000 tons. During 1917 consumption diminished somewhat, but in 1918 not only was the increase resumed, but the demand was so great that a world shortage of tungsten was threatened. Probably 90 per cent of the tungsten produced is consumed in making special steels.

Cutting tools are undoubtedly the leading products of the special tungsten steels. Magnet steels, especially for automobile magnetos, also use an appreciable amount of tungsten. Certain valves on aeroplane engines are constructed of tungsten steels which withstand heat and wear as does no other material.

A small proportion of the supply is used as "ductile" tungsten—that is, tungsten worked up into wires or small solid shapes. A very important and special use of tungsten in this form is in the manufacture of Roentgen or X-ray tubes.

The supply of tungsten consumed in the United States is derived from domestic mines and imports of ore concentrates from the Orient and the west coast of South America. In 1913 and 1914 domestic production far exceeded imports. In 1915 the lead was not so great, for imports showed a tremendous increase. The excess was again small in 1916, while in the last two years of the war period imports exceeded the domestic production.

The sale of tungsten ores is based upon the per cent of tungstic acid (WO_3) in the ore. Thus, an ore containing 60 per cent WO_3 , or 60 units of 20 lb. each per short ton, sells at so much per unit. The following tables show the available supply of 60 per cent concen-

trates derived from domestic production and imports:

Supply of 60 Per Cent Tungsten Concentrates, 1913-1918—
Net Tons

Year	Production	Imports	Total Supply
1913.....	1,537	449	1,986
1914.....	990	299	1,289
1915.....	2,332	1,776	4,108
1916.....	5,923	3,973	9,896
1917.....	4,605	4,876	9,481
1918.....	*4,800	*10,365	*15,165

*Estimated.

Domestic production comes principally from California and Colorado. At least two major markets exist for the purchase and sale of tungsten ores. The prices quoted herewith are for material sold f.o.b. cars in California. The Boulder (Colorado) market has varied somewhat widely from the California prices at times. But the prices in the California market have been applied to the total supply to avoid complications.

The price of 60 per cent tungsten concentrates in January, 1913, was \$7.50 per unit of 20 lb. of WO_3 . In March a slight advance was registered, and this continued until June. From that time until the middle of 1914 little change was indicated. The price offered provided little inducement to miners, and as a result the domestic production was very low. When the European war broke out the tungsten market was hard hit for a while, but soon the inquiries for ore became more insistent.

Throughout the last half of 1914 and first six months of 1915 the price was slightly less. An advance beginning in July, 1915, and gaining momentum through the last quarter reached its culmination in April, 1916, when \$80 per unit was quoted. This advance was due to the enormous demand for high-speed tool steels needed in meeting contracts for making shells and guns for the European Allies. The scarcity of domestic metal was relieved by importing ores and by economizing in the use of tungsten steels in tools. It was found that a weld could be made between a tungsten steel and an ordinary variety so that only the cutting edge need be made from special alloy. Under these two influences the supply became easier, and prices dropped through the remainder of the year.

A slight upward trend was experienced during the first half of 1917, and the price remained fairly constant until the end of the year. The market fluctuated within very narrow limits throughout 1918, prices ranging close to \$25 per unit.

[The bulletin's tables show the highest price for the ore to have been \$3,120 per gross ton in April, 1916, with the average for that year at \$1,501.50 per ton, spot, San Francisco.]

Ferrotungsten

Nine-tenths of the tungsten consumed in this country is used in the production of special steels. Of this, six-sevenths is used in the form of ferrotungsten, an alloy containing from 70 to 92 per cent tungsten.

The production of this alloy for each of the six years can not be stated, but the trend must have been closely comparable to the increasing supply of ore as given above. In 1917 about 632,000 lb. of contained tungsten were produced monthly, and of this amount approximately 77 per cent was in the form of ferrotungsten.

Unfortunately, it was impossible to obtain a complete series of prices of ferrotungsten for the six-year period.

It is proposed to establish a metallurgical exchange at Zurich, Switzerland. The proposal is being put forward by the Société pour Valeurs de Fer et d'Acier, Schaffhouse, says *London Engineering*. It is considered that such an exchange, which would meet regularly every Friday, would give an opportunity to English firms to send a representative to Zurich where he could get into direct touch with buyers in Switzerland in the easiest possible manner. The organizers propose to circularize their intentions by sending the circular to prominent British firms who might be interested.

The Central West and Pittsburgh Basing

Cleveland Manufacturers Interested in Controversy, But Not Disposed to Take Active Part—Steel Men and Others Give Views on Labor Problems

[Editorial Letter]

CLEVELAND, Aug. 23.—Cleveland manufacturers of iron and steel products refuse to become excited in regard to the controversy pending before the Federal Trade Commission about the Pittsburgh basing point. It is interesting to recall in this connection that for a number of years a prominent Cleveland buyer of steel bars objected vigorously to the Pittsburgh basing system, declaring it was unjust, and threatening to build a steel plant of his own. Pittsburgh manufacturers were not disposed to take the threat very seriously, but finally it was carried out and the steel plant was built. The present owners of the plant do not, however, share its founder's opinion, but believe that the custom of quoting on a Pittsburgh base and adding the freight to points of delivery is a convenience which works no injustice. An official of the company pointed out that in times of active competition little attention is paid to the Pittsburgh basing custom, and freights are absorbed whenever it is necessary to do so.

The president of a leading steel company, when questioned as to what he expected to do, said he really did not know, as he had not thought much about it. It was suggested to him that the opponents of the Pittsburgh basing plan argue that it tends to make price agreements easier. His reply was that he did not think agreements amounted to much anyhow. Cleveland manufacturers may file briefs with the Federal Trade Commission as a matter of courtesy in response to the request that has been made, but it is not probable that they will be active at the Washington hearings.

The nut and bolt manufacturers, at their meeting in Pittsburgh yesterday, declared unanimously in favor of continuing the present method of quoting. These manufacturers now buy bars on an f.o.b. Pittsburgh basis and sell their own product likewise f.o.b. Pittsburgh.

Are Workingmen Ungrateful?

A feature of the present labor situation is the pessimistic attitude taken by some manufacturers, who assert that labor was never so well treated and never has shown so little appreciation as at the present time. The president of a large manufacturing company said to me this morning: "Some of the companies that have done the most in the way of welfare work, profit-sharing and all that sort of thing are having the most trouble. The men are showing no gratitude whatever. I'm tired of it all."

On the other hand, a steel manufacturer of large experience, when told of this remark, said: "I do not feel that way. This old world has been thoroughly shaken. We are all more or less nervous and are showing the effects of the strain of the past five years. It is like the horrible headache of the day after. This applies to employers and to employees. There is much to be said on the side of the employees."

"If you have labor troubles, do you meet your men personally?" was asked.

"I do sometimes. I'm always glad to do so, if it seems best. But I find that men are likely to be suspicious or distrustful and inclined to feel that the president of the company is more skillful in driving a bargain than they are, or has some ulterior motive. When a committee of our employees comes to this office, I find that its members are likely to be rather ill at ease, and it is necessary for us to smoke a number of cigars before the embarrassment is removed. For this reason I prefer to act through a superintendent or foreman or other men in the plant."

Collective Bargaining

"Do you believe in collective bargaining and the recognition of the union?"

"I am entirely willing to negotiate with representa-

tives of our own men, but not with outsiders. I find that if our men are treated fairly, they do not insist upon the recognition of the union. Some of the demands which seem almost excessive at first really are not insurmountable. If, for example, a demand is made for the 8-hour day, I think the best plan is to tell the men that you will grant it. But show them that they cannot make as much as if they work 10 or 12 hours. Not infrequently if a vote is taken on working 8 hours, or 10 or 12, the men will vote by large majority for the longer hours, but the point is that they feel better if they are given a chance to exercise an option of this kind."

Knowing the Employees

The importance of establishing closer relations with the workmen is being recognized to a greater extent. Harry N. Clarke, now a manufacturer, who first as an employee and later as an employer has given a large part of his time to establishing closer relations with workers, was asked some time ago by the president of a Cleveland company how he accounted for so many dishonest and unreliable workmen. His reply was: "Because there are so many irresponsible and dishonest presidents, managers and superintendents." Mr. Clarke says that the first step is for employers to correct their attitude of mind with the men working with them. He believes that most foremen go as far in their helpful relations to the men as they are shown by the example of the management. The attitude being shown by the foremen immediately in control of industrial workers is determined, he says, by the way the foremen find themselves handled by the management. Mr. Clarke never fails to emphasize the importance of executives, especially the presidents of the companies, managing their own labor problems. He says that finances, purchases and sales can be delegated to hired hands and brains, but human relations call for personal contacts. He has himself called on thousands of men in their homes, but he says that he does not expect that employers as a rule will do this to any large extent. He does believe, however, that if the president of a company will keep in close touch with some men, the foremen will do the same and thousands of men can thus be knit together in a large, homogeneous family. "Remember," he says to the manufacturers, "production grows out of harmony and harmony is built on personal relations, which means yourself, your time and your energy." In other words, manufacturers are called upon to give to their men some of the time which they are now giving to selfish pursuits.

I asked a Cleveland man who was a leader in safety work what he had to say as to the allegation that recent strikes proved the workingmen are opposed to profit-sharing and that representative forms of industrial democracy have accomplished nothing. His reply was that there is little, if any, basis for such an allegation and that in some cases conditions would have been much worse had it not been for the effort which had been made along the lines of profit-sharing and the encouragement of industrial democracy.

Timidity at Washington

The shortage of cars is causing much anxiety to some Cleveland manufacturers. One of the photographs recently displayed in the Senate by Senator Pomerene, showing large numbers of new cars unnumbered and unused, while manufacturers were clamoring for cars, came from Cleveland. I asked one of these manufacturers how he explained this condition. "Well," he said, "the price named for these cars is, we'll say, \$3600 apiece, which compares with about \$1400 or \$1600 which prevailed before the war. Railroad direc-

tors object to accepting the cars and they stand idle." When asked why Director General Hines does not take the cars and use them, this manufacturer's reply was: "A wonderful timidity has come over officials in Washington. It was shown early in the war period before the business men went down to Washington, and now

is being manifested again. Many officials seem to be afraid to take any decisive action."

It will be interesting to observe how long these cars are allowed to stand idle. While winter approaches, many plants are facing shutdowns on account of inadequate supplies of coal or coke. G. S.

The Present Situation in Ferromanganese

Large Decline in Domestic Output—Imports and Available Supplies—Spiegeleisen Production Small

DOMESTIC production of ferromanganese for the first half of 1919, according to the blast-furnace reports of THE IRON AGE, was 101,123 gross tons, or 16,854 tons per month. The decline in output in the second quarter has been heavy, or nearly 50 per cent less than in the first quarter; the production in April, May and June was only 37,338 tons as against 63,785 tons in January, February and March. The monthly output of 16,854 tons for the first half of this year contrasts with 28,775 tons per month in 1918, with 21,793 tons per month in 1917 and with only 9,958 tons per month in 1913.

The spiegeleisen output for the first half of this year has been only 34,572 tons or 5765 tons per month with a decided shrinkage in the second quarter. In 1918 the monthly output was 20,775 tons, with 10,507 tons per month in 1913.

Output of Ferromanganese and Spiegeleisen

The following table gives the output of both alloys for the first half of 1919:

Output of Ferromanganese and Spiegeleisen, First Half of 1919—Gross Tons

	Ferromanganese	Spiegeleisen	Total
1919			
January	21,331	11,456	32,787
February	21,671	6,309	27,980
March	20,783	6,146	26,929
April	16,325	2,778	19,103
May	11,157	3,447	14,604
June	9,856	4,436	14,292
Total, first half...	101,123	34,572	135,695
Aver. per month	16,854	5,762	22,616
Aver. per month in 1918	28,775	20,775	49,525
Aver. per month in 1917	23,833	16,107	37,222
Aver. per month in 1913	9,958	10,507	20,464
Five-year aver., 1910 to 1914	8,280		

As compared with pre-war data the present output of ferromanganese is considerably larger than that of 1913 while that of spiegeleisen is practically less than half that of 1913.

Imports, Exports and Available Supply

The available supplies for the first half of this quarter are shown by the following tables of output, imports and exports:

Available Supplies of Ferromanganese in Gross Tons				
1919	Output	Imports	Exports	Available Supplies
January	21,331	850	8	22,173
February	21,671	2,620	66	24,225
March	20,783	5,741	17	26,507
April	16,325	4,301	441	20,185
May	11,157	none	545	10,612
June	9,856	1,800	130	11,526
Total	101,123	15,312	1,207	115,228
Aver. per mo., first half	16,854	2,552	201	19,204
Aver. per mo., 1918	28,875	2,264	298	30,741
Aver. per mo., 1917	21,486	3,703	776*	25,413
Aver. per mo., 1915	12,021	4,605	...	...
Aver. per mo., 1913	9,958	10,672	...	...
5-year ave., 1910-1914	8,280	8,399	...	...

*First half only

The shrinkage in imports is the feature of this data, the present monthly average of only 2552 tons being but 25 per cent of the pre-war receipts of 10,672 tons per month. Imports since April have been still less. Thus far the export trade has amounted to very little.

Manganese Ore Imports

Imports of manganese ore are continuing on a fairly large scale. The monthly average for the first half of 1919 has been 37,664 tons per month as compared with the record figures of 52,498 tons per month in 1917 and with 40,942 tons per month in 1918. In 1913 only 28,757 tons were brought in per month, so that the pres-

ent imports are low relatively. The following table from Government data shows imports of high grade ore:

Manganese Ore Imports—Gross Tons			Monthly Average
1919—	Total		
First quarter	115,321		38,441
April	59,470		...
May	19,644		...
June	31,550		...
First half	225,985		37,664
Calendar year, 1918	491,303		40,942
Calendar year, 1917	629,972		52,498
Calendar year, 1915	320,784		26,732
Calendar year, 1913	345,084		28,757

British Manganese Ore

British imports of manganese ore in the first half of this year have been 194,601 gross tons or 32,433 tons per month. These imports compare with 30,467 tons per month in 1918, with 36,625 tons per month in 1916, with 39,953 tons per month in 1914 and with pre-war imports of 50,098 tons per month in 1913.

Estimated Consumption

Not long after the United States entered the war an official estimate placed the monthly needs of the steel industry at 28,000 tons of ferromanganese, based on 80 per cent alloy. Production was then at the rate of over 40,000,000 tons of ingots and castings per year. At present the output is probably not over 36,000,000 for all of 1919. Assuming the 1919 output to total 36,000,000 tons and that 74 per cent of this is open-hearth steel, as in former years, with two-fifths of the Bessemer output absorbing spiegeleisen in high carbon steel, the following calculation gives the estimated amount of 80 per cent ferromanganese necessary this year at 17 lb. per ton of steel produced:

Gross Tons		
36,000,000 × 74	=	26,620,000 open-hearth steel
36,000,000 — 26,620,000	=	9,380,000 Bessemer steel
9,380,000 × 2/5	=	3,752,000 high carbon Bessemer steel
9,380,000 — 3,752,000	=	5,628,000 low carbon Bessemer steel
26,620,000 + 5,628,000	=	32,248,000 steel requiring ferromanganese
32,248,000 × 17 = 548,216,000 lb.	=	244,739 ferromanganese necessary in 1919

Adding to the above 244,000 tons the 10,000 tons estimated normally as needed in the iron foundry business we have 254,000 tons of 80 per cent alloy, or 21,160 tons per month as necessary for our present needs. Based on the rate of production the first half of this year, 16,800 tons per month, the present output is not equal to the estimated needs. Based on average available supplies of 19,200 tons per month for the first half, the theoretical supply for the year would be 230,000 tons or about 24,000 tons less than the amount theoretically needed. It is probable that there are large stocks on hand in the country which more than make up for this theoretical deficiency. At any rate probable increased British imports will also be a factor.

An industrial survey of Portland, Ore, has just been undertaken to find out what the city lacks which would make it more attractive than other coast ports as a location for industries. The City Council, the Commission of Public Docks and the Port of Portland Commission have jointly appropriated \$30,000 with which to carry on the investigations. Two important features are definitely expected to be added to the city's industrial assets as a result of the survey: Provision of a belt line railroad and the development at public expense of a large tract of land suitably located, with respect to rail and water terminals, for manufacturing purposes. Factory sites, with all public facilities, will then be leased or sold by the city at a nominal price.

Believe Strike Reports Are Exaggerated

Steel Officials Do Not Credit Statements
as to Number of Men Who Have Voted to
Quit Work if Demands Are Not Granted

YOUNGSTOWN, OHIO, Aug. 26.—District iron and steel executives are inclined to feel the vote taken among the employees in the industry by the American Federation of Labor is exaggerated, both as to the total and as to the number in favor of a strike. While labor officials, who met behind closed doors when they tabulated the vote, refused to give exact figures on the vote, William Z. Foster, Pittsburgh, secretary-treasurer of

the class that seeks to earn all it can, refuses to become Americanized and scoffs at American ideals and institutions.

All plants here have adopted the basic 8-hr. day, and officials declare the bulk of common labor, which consists of aliens, does not desire to work 8 hours, but 10, 12 and 14. The industrial engineer of a district corporation states frequently foreigners have come to

Resolutions Adopted by Elected Representatives of Employees of Steel Companies

Representatives of employees of the Midvale Steel & Ordnance Co., Cambria Steel Co. and subsidiaries, at a meeting on Aug. 22 and 23 at Atlantic City, N. J., adopted resolutions declaring "the persistent and unceasing demand of workmen employed in all classes and kinds of industries for a shorter day's work and an increased wage in order to meet the present high cost of living is uneconomic and unwise and should not be encouraged."

Ninety-three workmen made up in three committees from the Johnstown, Coatesville and Nicetown plants of the companies unanimously adopted the resolutions. These committees were elected by the workers in the three plants under employees representation.

The resolutions, which follow, are declared to represent the thoughts of 30,000 employees:

Whereas, The high cost of living needs to be abated by diligent, efficient and conscientious labor, by thrift and by avoidance of waste and extravagance;

And whereas, The price of commodities is regulated by the day's labor of a man and the real unit of value or the unit of compensation is not a dollar, but the purchasing price of a dollar, and that the price of all things, meaning the average price of everything we use and consume, which is commonly referred to as the average price of commodities, is fixed, regulated, raised or lowered by the average compensation received for one hour's work by every man and every woman;

And whereas, We believe the only sure remedy for the high cost of living is increased production and the stabilization of prices in conformity with wages now being paid;

And whereas, We believe any workman who demands a greater proportionate return for his labor than his fellow workmen in other lines are getting is as guilty of profiteering as a grocer who charges exorbitant prices for the necessities of life, and that increases in wages paid to certain classes of workers by the Government or others will result in higher prices

being set by the profiteers for the necessities of living to all purchasers alike;

It is, therefore, resolved, That the persistent and unceasing demand of workmen employed in all classes and kinds of industries for a shorter day's work and an increased wage in order to meet the present high cost of living is uneconomic and unwise and should not be encouraged.

Resolved further, That private monopolies should be controlled and profits restricted to a rate that shall be fair to the consumer.

Resolved further, That unnecessary exports of food and clothing be restricted and that all stores of hoarded supplies be uncovered and placed in the open market.

Resolved further, That copies of this resolution be forwarded to the President of the United States, to the senators in Congress from Pennsylvania and to the congressmen of the various districts in which are located the various plants of the Midvale Steel & Ordnance Co., and to the State and municipal authorities, to the end that they may by all the powers and means to them available endeavor to bring about normal conditions, with special privileges to none but justice to all, and sure and swift retribution for those who may attempt to profiteer in the necessities of life.

the national committee for organizing iron and steel workers, stated the number was in excess of 300,000. The welfare director of a big Youngstown independent states he has knowledge that when the vote was taken in his plant one union official marked 20 ballots and another 12. Other instances of the same kind are cited by officials and workers in the local mills, giving credence to statements of executives that the vote is exaggerated. They also declare the larger percentage of union recruits in the recent organization drive came from the ranks of foreign-born workers, and especially

his department complaining employees of other mills were enabled to work longer hours than they.

It is pointed out, furthermore, by steel mill executives that in June the Amalgamated Association of Iron, Steel and Tin Workers made its usual yearly agreement with manufacturers' representatives, at the Atlantic City conference. This agreement will not expire until June 30, 1920, and if employees in this division strike they will violate the provisions of their contract. It covers wages and details of working conditions.

It is generally felt here the principal fight will be on the "right of collective bargaining," which is interpreted to mean the right of employees to form unions and to deal with the companies through such organizations. A leading manufacturer stated emphatically "the steel industry would not submit to nationalization nor control by the labor unions when they assume no financial risks."

Mill officials in close touch with the labor situation are emphatic in stating that fully 85 per cent of the men, at a conservative estimate, do not favor a strike. Aside from partial support by the foreign element, it is felt a strike would receive encouragement from some of the younger, single men, without obligations. In face of present peak living costs, employees with families are loath to walk out, and it is believed hundreds of them would remain loyal to their employers.

One of the leading manufacturers points out that the steel industry has been foremost in adopting democratic methods in operation in increasing wages beyond all precedent, in looking after the welfare of its employees, in providing them sanitary living conditions by the construction of dwellings on a large scale, in allowing its workers to participate in the profits of the business by purchasing stock on most liberal terms and in adopting systems of representation whereby employees are given a large voice in determining such paramount considerations as wages and working conditions.

Manufacturers here hope an amicable settlement may be reached in the forthcoming crisis, but they are determined to stand out against labor organizations controlling the industry and assuming a position where they can dictate to the owners, officers and stockholders of the corporations.

The tabulation of ballots taken among employees of the iron and steel industry shows that 98 per cent are in favor of a general walkout unless demands to be presented manufacturers are granted. The result was tabulated at a meeting last week of 40 representatives of 25 international unions affiliated with the American Federation of Labor. It was held behind closed doors. These representatives constituted the national A. F. of L. committee for organizing iron and steel workers.

Following the session William Z. Foster, 303 Magee Bldg., Pittsburgh, secretary-treasurer of the national organizing committee, announced that a sub-committee of six members had been appointed to arrange a conference with officials of the United States Steel Corporation and the leading independents to consider the demands. If the steel executives refuse to meet with the union leaders during the next 10 days, a nationwide strike will be called on or about Sept. 1, Labor Day, he said.

This sub-committee consists of Samuel A. Gompers, president of the American Federation of Labor, who is expected home in a day or two from Europe, chairman; John Fitzpatrick, Chicago, vice-chairman; D. J. Davis, Pittsburgh, assistant president of the Amalgamated Association of Iron, Steel and Tin Workers; E. J. Evans, Pittsburgh, agent of the International Brotherhood of Electrical Workers; William Hannon, Washington, member of the executive board of the International Association of Machinists and W. Z. Foster, Pittsburgh, organizer for the Brotherhood of Railway Carmen of America.

Mr. Foster declared the canvass revealed that substantial organizations of workmen have been effected in every plant of the Steel Corporation and in all the larger independents. "We of course desire to have no strike and will do everything in our power to prevent one," he stated.

Union leaders declined to give exact figures of the total number of ballots.

Not less than 10,000 union workers in St. Louis will receive an increase in the wage scale or a cut in working hours as a result of negotiations between employers and unions within the last month. The list includes machinery movers and heavy haulers, steamfitters, steamfitters' helpers, asbestos workers, and boot and shoe workers. The wage increases average 13.6 per cent and the cut in working hours is from 50 to 44 per week, on a wage basis of 50 hours.

Wages and Employment in Iron Industry

WASHINGTON, Aug. 26.—Wages and employment in the iron and steel industry showed a decided retrograde movement in May, 1919, in comparison with the figures of a year ago, according to the publication which has been issued by the Bureau of Labor Statistics. In 114 plants in the iron and steel industry reporting in May, 1918, there were employed 215,376 workers. This number dropped to 175,970 in May, 1919, a decrease of 18.3 per cent. The payroll for these employees on a half-monthly basis dropped from \$12,851,528 to \$10,614,879, a decrease of 17.4 per cent. In 42 automobile manufacturing establishments the number on the payroll increased from 91,136 in 1918 to 106,725 in 1919, an increase of about 15.8 per cent, while the payroll figures, on a weekly basis, rose from \$2,433,548 to \$3,197,207, or 31.4 per cent. In 42 car building and repair shops the number on the payroll was 50,669 in May, 1918, and 44,023 in May, 1919, a decrease of 13.1 per cent. The payroll figures on the half-monthly basis for this industry, however, remained almost stationary, being \$2,419,980 in May, 1918, and \$2,402,469 in May, 1919, a decrease of 0.07 per cent. In explanation of these figures, the bureau says:

"Iron and Steel.—A number of decreases were reported in iron and steel, many of which were in accordance with the rules of the Amalgamated Association of Iron and Steel Workers. The entire force in the two plants was decreased 25 per cent. The rolling mill piecework rates in one plant were reduced 18 per cent. About one-third of the employees in one plant and 15 per cent of the force in another plant were decreased 17½ per cent. The 65 per cent bonus, affecting all of the employees in one mill with the exception of the bar mill pieceworkers, was reduced to 40 per cent. A decrease of approximately 14 per cent, affecting about 50 per cent of the employees, was reported by one plant. About 45 per cent of the employees in one plant received a decrease of about 12 per cent; and a reduction in rates, averaging 11 per cent and affecting 40 per cent of the men, was made by another plant; while a third plant reported a decrease of about 11 per cent, affecting approximately 50 per cent of the employees. A 10 per cent decrease, which affected three-eighths of the employees, was made by one concern, and about 1 per cent of the force in one plant were decreased approximately 9 per cent. Three plants reported decreases of 6, 5 and 3, affecting one-third of the employees, 10 per cent of the force, and about 50 per cent of the employees respectively."

In the World of Labor

Owing to the employment of one or two men to whom there was objection, several thousand employees of the Bethlehem Shipbuilding Corporation, Sparrows Point, Md., went on strike last week, but by the end of the week it said that the difficulty had been practically straightened out and that most were back at work.

Following the discharge of about 200 men at the works of the Frick Co., Waynesboro, Pa., manufacturer of boilers, machinery, etc., other employees at the plant, with exception of some men engaged in the foundry, declared a sympathetic strike, Aug. 18, with demand for reinstatement of the men. The discharge, it was said by company officials, was due to slackened orders and large stock of tractors and other equipment now on hand. The strikers were joined later by about 3000 other employees, recently unionized, at the local plants of the Landis companies and the Emerson-Brantingham Co., as well as other factories.

Employees in the sawsmithing department of E. C. Atkins & Co., Inc., Indianapolis, Ind., have received an advance in wages from 66 1/3c. to 74c. an hour; workers in other branches of the factory have been granted proportionate increases.

About 1000 employees at the plant of the Remington-Yost Co., Bridgeport, Conn., returned to work on Aug. 21, with acceptance of a 15 per cent wage increase. The workers in this typewriter manufacturing plant have been out with employees in other metal-working establishments in the city. Only one local plant is still

affected by the general strike declared about two months ago, this being the Columbia Graphophone Co., which has threatened to close its works permanently and remove to another city. This plant gives employment to about 6000 persons.

The Wyatt Boiler Works, Dallas, Tex., has decided on a lockout of organized employees, declaring for an open shop policy.

Employees of the Empire Steel & Iron Co., Mt. Hope, near Dover, N. J., engaged at the local mines, have presented a demand for a wage increase of 75c. a day, covering a flat advance to all classes of workers. Laborers, or those receiving the lowest wages, are getting 50c. per hr. for 8-hr. day, while engineers, or highest paid men, are receiving \$8 a day. About 350 men are employed.

Employees in sheet metal plants at La Crosse, Wis., have received an advance in wages of 10c. per hr., with Saturday half holiday throughout the year.

Iron molders at the plant of the Durbin Foundries Co., East St. Louis, Ill., are out on strike with demand for wage scale of \$6 a day and 8-hr. day. The plant has been working on a 9-hr. basis.

The American Wire Fabrics Co., Mt. Wolf, Pa., distributed over \$50,000 in bonuses to employees at the plant on Aug. 20. The distribution of the fund is arranged on a sliding scale.

With claim that the constant laying off of workmen is not warranted, about 800 machinists and helpers at the Hampton, Pa., yards of the Lackawanna Railroad, near Scranton, declared a strike on Aug. 19.

Union machinists at Akron, Ohio, declared a strike on Aug. 22, with demand for a 44-hr. week, and wage rate of \$1 an hour, with second and third-shift men to work 40 hr. per week, with pay for 44 hr. A wage scale of 64c. an hour is asked for helpers, and the abolition of bonus and premium systems. About 24 local plants, it is said, will be affected. The International Harvester Co. works has reached an agreement recently with its machinists and men there have remained at work.

The Ordnance Department has issued a notice to employees at the Picatinny Arsenal, near Dover, N. J., that a bonus of \$250, payable in weekly installments, will be given to all workers who have been in the service of the Government six months prior to and including June 30, 1919.

Two hundred employees of the Standard Steel Car Co., Hammond, Ind., returned to work Aug. 22 and the settlement of a month-old strike is believed near. Fred L. Feick, federal mediator, who held a number of conferences with the officials and the strike leaders, regarded the situation as hopeful. The dispute between the men and the company was marked by several outbreaks of violence which necessitated the calling of 11 companies of Indiana militia. On Aug. 21 500 strikers marched on the plant in military formation, but were dispersed by the soldiers.

Striking employees of the Crane Co., Chicago, tried to wreck a northbound Kedzie Street car with bricks on Aug. 22. Every window in the car was smashed and two men were severely injured. Six weeks ago the entire force of the Crane plant, numbering 7000 employees, was called out on a strike by organizers sent out by the American Federation of Labor. Operation was resumed on Aug. 21 with about half the former force. It was for the purpose of intimidating those who had returned to work that the car was attacked.

The Western Steel Car & Foundry Co. recently resumed operations at Hegewisch, Ill., after a shutdown of two weeks.

Beginning Aug. 16, the Inland Steel Co., Indian Harbor, Ind., changed from two to three shifts a day, giving its 10-hr. employees 9½ hr. pay and its 12-hr. men about 11½ hr. pay for 8 hr. work. Under this arrangement they do not receive so much per day, but the rate per hour is considerably higher and the cost to the company increased. The new plan was adopted

at the suggestion of the employees through their representatives on the works councils.

In accordance with wishes of W. A. Thomas, president, the new athletic stadium created by the Brier Hill Steel Co. for its employees will be called the Brier Hill Athletic Field, instead of the Thomas Athletic Field. It will be formally dedicated Labor Day. It is one of the most up-to-date industrial athletic arenas in the country, containing a large grandstand, baseball, football fields, tennis courts, cinder track, swimming pool and dancing pavilion.

In a raid at East Youngstown, Ohio, near midnight Aug. 19, federal agents rounded up 90 alleged Bolsheviks, practically all of them employees of the Youngstown Sheet & Tube Co. All of those arrested were foreigners, including 30 Russians.

Nearly 1000 workmen in metal-working and wood-working industries at Two Rivers, Wis., walked out Aug. 15 to enforce demands for an 8-hr. day, recognition of unions, and higher pay. The plants affected are: Aluminum Goods Mfg. Co., factories 1 and 4; Kahlenberg Bros. Engine Co.; Two Rivers Plating & Mfg. Co.; Hamilton Mfg. Co.; Wisconsin Textile Mfg. Co.; F. Eggers Veneer Seating Co. Nearly all of these concerns are building large factory and shop additions. By Aug. 23 about 10 per cent of the strikers had returned, but the outlook is for a protracted strike.

With one exception all stove foundries in Belleville, Ill., will be idle for an indefinite number of days as a result of the strike of the Union Foundry employees. The manufacturers consider the demand for a raise of from 45c. to 60c. per hour unreasonable for common labor, and the strike a breach of contract. The Orbon Stove Works, the largest manufacturing plant in the city, is not affected by the strike, its employees not being members of the Foundry Employees' Union and that plant is in operation now after two weeks' shut down due to trade reasons.

Rioting in connection with a general walkout of street car men in Louisville, Ky., has caused a good deal of unrest among general union workers, and threatened general strikes. However, labor is generally under contract, and a general strike is not thought likely. Machinists in several plants have been out for weeks, and a number of trades are out, including electricians. The recent railroad strikes did not affect Louisville directly. The Louisville & Nashville R. R. has announced that it is now taking back all men laid off by the Railroad Administration in June.

Labor troubles at the plant of the Algoma Steel Corporation, Sault Ste. Marie, Ont., have resulted in an almost complete shut down, according to men working in the blooming mill, rail mill and open-hearth plant, and as yet a settlement does not appear near. According to M. T. Gleason, secretary of the Trades and Labor Council, the men in the blooming mill were given the preference of either having some of the crews cut or the plant closed. In ten minutes' time, according to labor headquarters, the mill was shut down and the labor officials went so far as to call it a lockout.

Labor Conditions at Worcester

WORCESTER, MASS., Aug. 25—Labor at the Worcester works of the American Steel & Wire Co. is not organized, excepting perhaps in a few trades, sparsely represented and having no direct connection with the manufacture of wire. Nor is any special effort under way to effect the unionizing of the plants. Search for evidences of unrest fails to discover any appreciable sign of it. The Worcester wire mills have always been singularly free from labor troubles. Throughout the history of the American Steel & Wire Co.'s ownership, and back of that, in the days of the Washburn & Moen Mfg. Co., there has never been a strike, with the exception of a few trifling affairs so local in character as not to be considered seriously, especially as they had to do with other classes of labor than the wire workers. The cordial relations between the management and the workers has always been proverbial. The company's

system of educating employees in connection with accident prevention and securing their active co-operation in this and other efforts has become a very important factor indeed and in itself has acted as a discouragement of labor organizers. The average intelligence of wire mill labor in Worcester is much higher than in many plants of like character elsewhere in the United States. The percentage of illiteracy is lower, and there is a larger proportion of native-born workmen. Then, too, many of the families represented on the company's payroll are by no means in their first generation in these mills. The large percentage of Swedish-born Americans and their children is yet another influence. No one has the idea that Worcester would be affected by any radical action on the part of employees of the steel mills of the country. This is also true, it is believed, of the several plants of the Clinton-Wright Wire Co. The recent strike of some of the wire workers at the company's Palmer plant ended quickly, with no concessions on the part of the management.

The strike of molders in the Worcester foundries drags along, with practically all of the foundries operating, some of them at full capacity. The announced plans of the Coppus Engineering & Equipment Co. to build large additions to its brass foundry, to make it one of the largest of its kind in the East, is significant of the confidence of the owners of their ability to do business as usual in spite of the union. Trouble in the ranks of the unions has been precipitated by the return of the molders to the plant of the L. W. Pond Foundry & Machine Co. The impression was given out by the men that they returned with the rights of the union recognized, but the members of the allied organization, the Foundry Employees' Union, composed of the unskilled labor of the plants, protest that the striking molders and coremakers returned to work side by side with non-union men, which is the fact.

The strike of eight tackmakers at the factory of the Diamond Tack & Nail Works, Worcester, Mass., formerly owned and operated by P. E. Somers, and still managed by him for its owners, illustrates very well the direct far-reaching and unjust results of some of the recent strikes. There had been no trouble whatever at the plant. The tackmakers were working on a schedule agreed upon some time ago between the manager and themselves, including \$50 for a 48-hr. week, which hours went into effect with the operation of the new Massachusetts law governing the employment of women and males under 18 years, and there were no apprentices nor night work. The Tackmakers' Union in attacking the New England situation presented demands which would produce conditions for the workers not very different from those in the Worcester factory, but which do not prevail in some other places, notably at Brockton, Mass., where the industry centers. The demands provided for \$54 a week, or \$9 for an 8-hr. day, and certain restrictions in the number of machines a man may operate. The move was not aimed at Worcester, as has been said, and the eight tackmakers had no wish whatever to change their working condition, as they state frankly. But they were called out, and answered the call. The result is that the factory is shut down and 65 employees are out of work, though only eight of them are members of the union.

Some 200 employees of the Worcester Machine Screw Co., Worcester, Mass., branch of the Standard Screw Co., went on strike Saturday because of the refusal of the management to grant the demand for a 50-hr. week, with a flat increase in wages to give the same earnings for the shorter week as for the 55 hours, which is the company's standard schedule. With the falling off of business following the armistice, the works went on a 50-hr. week in some departments and a 40-hr. week in others, according to the demand for various classes of products. In the one case the men worked five 10-hr. days, in the other four 10-hr. days, Saturdays being idle. Recently the schedule was changed to five 9-hr. days and a 5-hr. half day Saturdays. The employees presented a demand for a 50-hr. week with a 10 per cent increase in pay. The management answered that it would make no flat increase, but would deal with the men as individuals, considering each as a case by itself, and adjusting wages according

to length of service and merit. Then the men asked for a longer week, that they might earn the more, and the company granted the right to work 55 hours, with time and a half for the five hours' overtime. The employees decided to adhere to their demand, and the strike followed.

What is the Labor Cost

WASHINGTON, Aug. 26.—Just what does the labor cost amount to on the principal items in the cost of living? This is a question Representative Carss of Minnesota desires answered. He has introduced a resolution directing the President to furnish the House with such information as may now be in the possession of the Federal Trade Commission "which shall identify or tend to identify the proportion that labor cost forms in the total cost of production of coal, steel, copper, oil, cement, lumber, paper, cotton textiles, flour, meat, canned goods and other important commodities."

Mr. Carss is approaching the subject as a friend of labor, taking the position that the argument that labor costs represent the chief item in the increased cost of living is fallacious.

Features of Metal Section of Safety Congress

At the eighth annual safety congress to be held in Cleveland, Oct. 1 to 4, papers to be read at the sessions of the metal section include the following:

THURSDAY, OCT. 2

Accident Prevention in a Malleable Iron Foundry, H. L. Church, Rockford Malleable Iron Works, Rockford, Ill.

The Personal Element in a Safety Program for the Foundry, M. F. Grantland, Marion Grey Iron Foundry, Marion, Ind.

FRIDAY, OCT. 3

Consider the Crane, C. C. Rausch, assistant director, Safety Institute of America, New York; O. J. Lewis, McKinney Steel Co., Cleveland.

New Ways to Put Safety Across in a Steel Plant, H. P. Heyne, United Alloy Steel Corp., Canton, Ohio, and H. W. Darr, Cambria Steel Co., Johnstown, Pa.

Practical Demonstration of Investigating Accidents, Court of Inquiry staged by H. J. Weeks, with employees of American Steel & Wire Co.

SATURDAY, OCT. 4

How the Foremen Cut Lost-Time Accidents, James F. Belford, acting secretary of labor, safety and welfare, American Smelting & Refining Co., New York; discussion, E. E. Judd, American Smelting & Refining Co., Omaha, Neb.

Humanizing a Steel Plant, Philip Stremel, superintendent hot mills, National Enameling & Stamping Co., Granite City, Ill.; discussion, Raymond G. Adair, American Rolling Mills Co., Middletown, Ohio.

Practical Demonstration of Welding and Cutting, Mr. J. Schleicher, the Alexander Milburn Co., Baltimore.

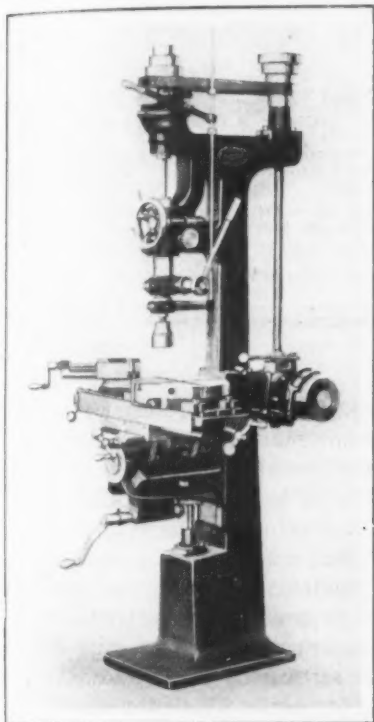
As a result of the lack of orders the Dominion Iron & Steel Co., Sydney, N. S., closed its plant on Aug. 23 for an indefinite period. One of the prominent officials of the company states that the plant was kept in operation last week in view of an order for 15,000 tons of billets, which the company received. Every man employed at the plant will be provided with work during the lay-off or until the company receives further orders. Most of these men will be given employment at the plate mill now being rushed to completion, while others will be used in repair work.

Manganese ore exports from the district of Santiago de Cuba, Cuba, for the years 1888 to 1917, inclusive, totalled 317,362 tons, according to the *Boletín de Minas*, Havana, Cuba. The largest exports were 38,883 tons in 1916 with 1907 second with 35,645 tons. The largest consecutive exports were from 1900 to 1904 when the range each year was from 14,500 tons to 30,142 tons. In 1888 the exports were 1942 tons. The lowest outgo was 704 tons in 1889.

The Standard Steel Works, Lewistown, Pa., are planning for increased operations at the plant. Some of the departments are now running full, while others are being operated a few days a week. When producing at normal, it employs about 5000 men.

Drilling, Tapping and Milling Machine with Drill Press Table

A drilling, tapping and milling machine equipped with a drill press table is now being manufactured by the Demco Machine Tool Co., 706 Frankfort Avenue, Northwest, Cleveland. For drilling it has a cone clutch engagement in direct or back geared drives with four open belt speeds and four back geared speeds. For



Machine for Drilling, Tapping, and Milling. For milling it is equipped with combination tilting tables

tapping it employs a cone friction clutch engagement both for the tapping operation and for reversing. There are four back-gear speeds for right or left hand tapping. For backing out the tap it employs a quick open belt reverse at two and one-half times the tapping speed. Automatic or hand engagement for tapping and reversing is provided.

Two models are being marketed, and that which is also designed for milling is equipped with combination tilting tables arranged for vertical cross or longitudinal hand feed. This particular

machine is built in single spindle type only. All controls are brought to the front of the machine, and the arrangement is such that the operator can lock the sensitive feed and feed positive. The vertical shaft is driven with bevel gears running in grease. Friction clutches, controlled by a hand lever, allow of instantly changing the drives to right or left, and a neutral position is also provided. The models built solely for drilling and tapping are supplied with one, two, three or four spindles. In this type the positive clutches, controlled by hand lever, also permits of changing the drive to right or left or putting in neutral. In this way spindles not working can be cut out or engaged instantly.

Policy as to Sale of Ships Modified

WASHINGTON, Aug. 25.—The Shipping Board's policy as to the sale of ships has been changed somewhat by John Barton Payne, the new chairman. While Mr. Payne believes in ultimate private ownership of the new merchant fleet, he takes the position that it will require a considerable time for the country to absorb such a vast amount of tonnage and that the Shipping Board should devote itself to building a permanent merchant marine.

Former Chairman E. N. Hurley sought to force the sale of ships as rapidly as possible. Mr. Payne, while willing to sell ships at the prices fixed by the board, prefers not to push them upon the market more rapidly than the country is ready for them. He has practically dismantled an extensive sales force established by Mr. Hurley at New York shortly before his retirement. A small sales office will be maintained in order to accommodate any customers who are anxious to buy ships, but the board will have no agents out trying to drum up business.

Mr. Payne held a long conference with President Wilson on Friday at which future policies for the merchant marine were discussed. Whether the President

takes Mr. Payne's view of the situation or not was not made known. It is expected that the President shortly will take the occasion to send some recommendations to Congress regarding merchant marine legislation.

Reading Iron Co. Buys Lessig Plant

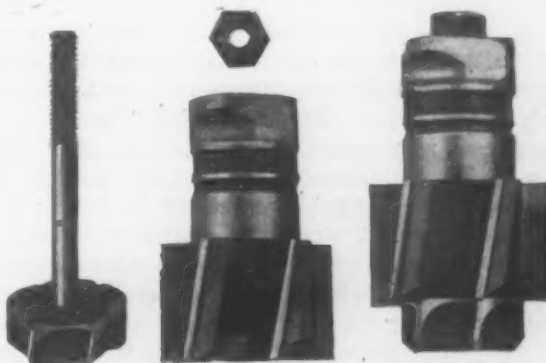
The Reading Iron Co., Reading, Pa., has purchased the plant of the George B. Lessig Co., at Pottstown, to give it a greater output of puddle bars. The Reading Iron Co. has been purchasing from the Lessig company a considerable quantity of puddle bars, and by operating the plant itself, will be able to control the manufacture of its entire consumption of puddle bars, thus controlling the quality of all material entering into the manufacture of its pipe.

The plant consists of two puddle mills, having a total of 22 double furnaces equipped with waste heat boilers and three two-high puddle mill trains and 22 in. three-high three-stand rolling mill for rolling nail plate and skelp, together with the necessary heating furnaces, gas producers, etc. The nail factory contains 105 cut nail machines, together with heating furnaces, rumblers, packers, etc. The plant is complete with warehouses, machine shop, blacksmith shop, cooperage shop and carpenter shop. It is located on the Philadelphia & Reading and the Pennsylvania railroads, and occupies about 12 acres.

It is planned to place the puddle mill in operation as soon as possible, and it is likely that the nail factory will be put in operation at a later date. The plant is now being overhauled, and as soon as the necessary repairs are completed, the puddle mill will be put in operation.

Interchangeable Core Drill

An interchangeable core drill has been put on the market by the Eclipse Interchangeable Counterbore Co., 1618 St. Aubin Avenue, Detroit. It saves the necessity of first drilling cored holes and then counterboring them, as it combines two operations in one. It is designed primarily for machining cored holes to prepare them for



A Core Drill for Drilling and Counterboring without Shifting Cutters

inserting plugs; however, its uses are varied. It is possible and practical to use a series of core drills of various diameters.

The core drills or reamers are interchangeable with the company's standard pilots in its standard cutters, and it is therefore not necessary to purchase special cutters to take the core drills. A wide range of sizes for each set of cutters is to be had.

A feature of this core drill is the method of automatically aligning itself with the cutter. For this it does not depend upon the shank, but upon the channels, which are designed and constructed in such a way that it must be concentric with the cutter at all times while in operation, even though it may be loose in the cutter.

The method of driving and aligning is applicable to reamers as well as drills and they are being supplied in conjunction with the counterbores.

ESTABLISHED 1855

THE IRON AGE

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Member of the Audit Bureau of Circulations and of
Associated Business Papers, Inc.

Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York
W. H. Taylor, *President and Treasurer* Fritz J. Frank, *Vice-President* George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 243 West 39th
Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips,
Vice-Pres. W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh:
Park Building. Boston: Equitable Building. Philadelphia:
Real Estate Trust Building. Cleveland: Guardian Building.

Cincinnati: Mercantile Library Building. Washington: 613
Fifteenth Street, N. W. San Francisco: 320 Market
Street.

Subscription Price: United States and Possessions, Mexico,
Cuba, Shanghai, \$5.00; Canada, \$7.50; Foreign, \$10.00 per
year. Single copy, 25 cents.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879

Encouraging Labor Developments

Whenever progressive measures are being adopted, there are conservatives who are glad to find anything that resembles proof of failure on the part of the progressives. This has been illustrated frequently of late by those who distrust all efforts to bring labor and capital into more friendly relations. Unfortunately strikes in a number of plants have seemed to support the contentions of some that representative shop government, profit sharing and other plans looking to an increase of good will are not practical; but close investigation of the facts shows there is little if anything upon which to base such a conclusion.

While here and there employees may not have appreciated the efforts made in their behalf, it is highly gratifying to note that some who have been taken into closer relationship with their employers are beginning to see that the latter are not wholly wrong and that the men themselves have not always been reasonable in their demands. The action of the elected representatives of employees of the Midvale Steel & Ordnance Co., the Cambria Steel Co. and its subsidiaries, as published elsewhere in this issue of THE IRON AGE, was taken entirely without suggestion by the company and shows a clear perception of the importance of checking the demands which are being made by workmen.

The preamble sets forth that the workman who demands a greater proportion of return for his labor than his fellow workmen in their lines are getting is as guilty of profiteering as a grocer who charges exorbitant prices for the necessities of life. One of the resolutions declares that the persistent demand of the workmen for a shorter day's work and increased wage in order to meet the present high cost of living is uneconomic and unwise. The truth of this statement is being emphasized by events, but its significance lies in the fact that it is made by a body of elected representatives of several thousand workmen at a time when many other workmen in the steel and other industries are preparing for even greater demands as to wages and hours of work. If democracy in industry, such as has been established by the Midvale and other companies, re-

sults in the men seeing economic problems in a new light and makes them influential in checking unreasonable demands, important progress has been made. Those who wish to maintain autocracy in business will find no comfort in the resolutions of the Midvale men. Their action and the clear, vigorous warning of President Wilson to the railroad shopmen and the American people constitute highly encouraging signs and prompt the hope that at last reason and common sense will prevail to save the country from the great perils which threaten it.

Federation Disservice to Labor

The American Federation of Labor renders a disservice to labor in endeavoring to lead the workers in the iron and steel industry to demand establishment of all or any large number of the twelve points announced after the Pittsburgh meeting of July 20. These points have been made the platform of the movement which has just come to a head in the announcement of a "strike vote" stated to be 98 per cent affirmative and the demand for a conference to be arranged between the manufacturers and the federation's committee of six by the end of this week.

American labor will profit by being efficient, and six of the twelve points represent direct blows at efficiency. The twelve points were printed in THE IRON AGE of July 24, page 253a, and again in the issue of Aug. 21, page 514. No. 10 requires that "seniority" shall be the sole guide when men are employed or dismissed. Where can there be the slightest incentive to do good work, or indeed to work at all on the company's time? Collective bargaining, reinstatement of men alleged to have been discharged for "union activity" when that is usually an admission of inefficiency, and the outrageous "check-off" all strike at the root of efficiency.

One of the most cogent arguments, from the efficiency standpoint, against Government operation of the railroads is that under Government operation one single rate for a given class of work must be fixed for the entire railroad system, regardless of variations in the cost of living, of different de-

degrees of skill in men and of the varying degrees of competition for men set up by other employers in various districts. The highest rate of pay necessary to staff a shop would be made standard for all. Such a system for the iron and steel industry would be ruinously inefficient.

It would be difficult to conceive any set of rules that would be more effective in making labor inefficient than those embodied in the labor union platform formulated for iron and steel works. It would be hard for anyone to devise a plan better calculated to hurt labor. One-half the community cannot pension the other half. Every one should render service, the best he can render, for what he receives. The American Federation of Labor is attempting a disservice to the labor it pretends to be friend.

These are facts that have been well known to the majority of the intelligent workmen, if not of all the workmen, in the iron and steel industry. With their minds unprejudiced by the wiles of professional agitators, the rank and file of the workmen in the industry would have voted themselves well contented with the conditions under which they labor.

Compliance of the iron and steel manufacturers to the extent of 50 per cent of the sum total of the demands represented in the twelve-plank platform would mean a virtual surrender of the properties to the union that the American Federation of Labor desires the industry to create, for the "check-off" means nothing else than that the employers produce the union. The railroad brotherhoods merely preceded the federation in demanding the surrender of property. If this is to be the order of the day in the United States, the iron and steel industry may as well be first to meet the issue as last.

A very curious feature of this whole activity is that it endeavors to parade as a very modern form of unionism. It is asserted that this movement should not be judged in the light of what labor unions used to do. The present leaders claim they are modern and enlightened. One of the old evils of unionism was "graft." What else is involved in the demand for double time on Sunday, when many if not the majority of the workers prefer that their six days of labor shall include Sunday?

It has been the usual thinking that labor demands run chiefly to the two matters of wage rates and hours of labor. Such demands, however, are distinctly subsidiary in the present platform. One-half the planks have not the remotest bearing upon rates or hours. There is tacit recognition that the men are very well paid now.

The demands are not such as can be debated between the manufacturers and the American Federation of Labor with any hope of a compromise being attainable. There is no conceivable way in which the demands could be moderated or modified so as to present a middle ground. Any conceivable changes in them would make them mean nothing at all or would still leave them to mean a complete surrender of the control of the iron and steel plants to the federation. The iron and steel manufacturers are therefore left with no alternative as to what they should do.

The Closed Shop as an Issue

The first of the twelve demands of the unions upon the steel manufacturers is stated to be the "right of collective bargaining." The men who framed the demands exhibited some adroitness in this statement. It is to be judged in the light of the eleventh demand, which calls for the "abolition of company unions." If the authors had said what they really meant, "We demand the closed shop in all steel plants," public sentiment would have been alienated at once, because the American people are opposed to the closed shop and believe that a free American citizen has a right to belong to a labor union or not and that an American employer should employ men whether they are members of a labor union or not. On the other hand, many employers believe in collective bargaining. Employees of a plant have a perfect right to organize and to take up their grievances with their employer by means of a committee or other representative method. But this does not mean that an outside union, not familiar with problems of the plant, perhaps knowing nothing about the kind of business carried on, shall be allowed to dictate to the employer how he shall operate his plant.

There is less and less disposition on the part of employers to oppose collective bargaining in the proper meaning of these words, but any effort to force the closed shop on the steel plants of the country will be vigorously resisted, by none more vigorously than by the great majority of the employees themselves.

The Manganese Industry's Decline

Conditions in the American ferromanganese market are fast approaching those prevailing in pre-war times. In 1913 the American output of standard ferromanganese averaged 9958 tons per month, made almost solely by one producer. In that year the average imports from Great Britain were 10,672 tons per month, which supplied about 50 per cent of our total consumption at that time. Our available supplies in 1913 averaged 20,630 tons per month.

Passing to post-war situation, the domestic production of ferromanganese fell from 28,775 tons per month in 1918 to 10,874 tons in July, 1919, with the average for May, June and July this year at 10,629 tons per month. While imports from Great Britain have not been large in recent months, they show signs of recovery, having been 1800 tons in June as against none in May and, with important sales recently made, they bid fair to increase. The country's available supplies for the first six months of 1919 were 19,204 tons per month, about the same as in 1913, while in 1918 these supplies averaged 30,741 tons per month, with imports playing a small role.

The rise and fall of the American ferromanganese industry is forcibly indicated by an analysis on other pages of this issue. From a monthly output of 9900 tons in 1913, practically by one producing company, over 20 American blast furnaces and electric furnaces produced 28,875 tons per month in 1918, an expansion of nearly 200 per cent. There

has now come a shrinkage to only 10,629 tons per month, with only two companies operating in the last three months, while the country's steel output more than equals that of 1913.

It is evident that British makers are anxious to regain their pre-war American trade in ferromanganese. Fairly liberal amounts are being offered at \$100, seaboard, or under what American makers claim is to them a profit-earning price. That British makers can regularly make such sales and get a profit, under conditions prevailing in that country, is open to question. The theory that present large stocks of manganese ore in Great Britain favor low cost production there is refuted by the fact that the average British supply of such ore for the years 1915 to 1918 inclusive was only 32,251 tons per month as against a supply of 50,547 tons per month in 1913.

It is regrettable that an American industry so vital to the steel trade should be allowed to revert to pre-war inactivity. The recent action of the House in voting for a duty on tungsten ores and alloys has suggested the appropriateness of a duty on ferromanganese, an alloy much more essential to the steel industry as a whole than tungsten. It may be argued that blast furnace operations in the United States should be carried on more cheaply than in Great Britain, but the average cost of the manganese ore mixture used in Great Britain is probably less than that of manganese ores used in furnaces of merchant producers in the United States. The question is complicated, however, and one of the complications has always been that the Steel Corporation is the chief producer of ferromanganese. That fact has worked against every tariff proposal in recent years.

Costly Procrastination

Instances are occurring repeatedly where manufacturers have planned increased wages or shorter working hours or both, but have put off the announcement to their workers until a demand has been made upon them, or, which is almost as bad, until the unrest that precedes a demand has made itself felt. As a consequence the employees believe their better pay and better hours came to them because the owners felt compelled to grant them and otherwise would have done nothing whatever. Procrastination of this sort is costly in loss of good will, a loss the more irritating because it is unjust.

The average worker can seldom see any good reason why owners should voluntarily make any concession which looks as if it reduced profits. They do not grasp the fact that apart from any feeling of friendliness for them, it is usually absolutely necessary for a management to sense the trend of the times in such matters as wages and working hours. Otherwise it is at a serious disadvantage. When good labor is scarce, as it is today, a plant cannot expect to compete and add to its force, everything else being equal, if other works in the district offer more attractive pay. Employees seem to lose sight of the fact that supply and demand govern hours and wages collectively as applied to a whole works, just as this law decreases or increases their individual earnings, and that owners often act accordingly without the need of threat or coercion.

Another thing many workers do not grasp. The cold and ruthless owner is almost a mythical character in American manufacturing industry. The owner is a business man. He will fight if he has to. But many a managing head regards his working force as a big family of which he is the head, and while he aims to treat each individual according to his deserts, many fare much better than they realize. Owners usually have a pride in their establishment, which of itself impels them to look after the welfare of all the people connected with it. And between pride and friendliness employees frequently receive benefits which are really uncalled for and which at times are not warranted by the condition of business.

Even where the workers realize something of this, when a concession is made following a demand or hint of an impending demand, it is hard to convince them they are simply getting what had already been planned. Sometimes the result has been encouragement of demands for more, which would never have been made, probably, had the announcement of the change been made with promptness.

President Farrell's Gift to Georgetown School of Foreign Service

An initial gift of \$20,000 toward a \$500,000 endowment fund for the Georgetown University, School of Foreign Service has been made by J. A. Farrell, president United States Steel Corporation and chairman National Foreign Trade Council. Since its inception in 1914 the National Foreign Trade Council has strongly advocated special education for foreign representatives of American industries, consuls and diplomatic agents. The School of Foreign Service had its initial term beginning Feb. 17 and closing June 23, 1919. Located at the National Capital, the school is able to work in conjunction with Government bureaus and various educational and commercial organizations, such as the Pan-American Union, the Chamber of Commerce of the United States, the Federal Trade Commission and the Department of Commerce. The Georgetown school has also cordial relations with the *Ecole Libre des Sciences Politiques*, Paris, after which it is modeled.

The plant of the McCarthy Drill & Tool Corporation, Clinton and Oakwood streets, Toledo, Ohio, together with the business and good will, has been purchased by the Fast Feed Drill & Tool Corporation, recently incorporated under the laws of New York, with an authorized capital of \$500,000. J. D. McGrath, formerly treasurer of the McCarthy Drill & Tool Corporation, is managing director of the new organization. The Fast Feed Drill & Tool Corporation will continue to operate the plant at Toledo, and will specialize exclusively in the manufacture of high-speed steel tools. Important additions and improvements to the present equipment are planned, and it is probable that a much larger organization will be required to handle the contemplated increase of production. There will be no change in the operating staff for the present.

Following the discharge of 200 workers by the Frick Co., Waynesboro, Pa., the 900 operatives of the company walked out, made the rounds of other manufacturing plants in the town and instituted a general strike, intimidating any non-union men who refused to join them. The total number of workers on strike is estimated at between 2500 and 3000. Other plants affected are: Emerson Brantingham Implement Co., Landis Tool Co., Landis Machine Co., Victor Tool Co., Cashmen Tool Co., Landis Engine & Mfg. Co.

CALLED ON JUDGE GARY

Labor Leaders Invited to Make Their Statement in Writing

John Fitzpatrick, Chicago, chairman of the committee for organizing iron and steel workers of the American Federation of Labor, William Z. Foster, Pittsburgh, secretary of the committee, and D. J. Davis, Chicago, called at the office of Judge E. H. Gary, chairman of the United States Steel Corporation, 71 Broadway, New York, Tuesday and requested an interview. Judge Gary politely declined to receive the visitors and afterwards made the following statement:

"When informed by my secretary that a committee of a labor organization consisting of Messrs. John Fitzpatrick, William Z. Foster and D. J. Davis had requested to see me, I sent word to them through my secretary that I did not care to have a personal interview, but if they had any statement to make and would reduce the same to a written letter, it would be received and considered by our officials, who would then determine what, if any, answer to make. Nothing further has passed between us. I think it is better for those gentlemen and for me to leave no chance for misunderstanding in regard to what has been or shall be said. I have intended no personal discourtesy."

In addition to the three members of the committee who called at Judge Gary's office, Samuel Gompers, president of the American Federation of Labor, is also a member. He arrived from Europe Tuesday.

Officers of Granite City Plant Elected

As the result of the sale of \$5,000,000 worth of preferred stock in the St. Louis Coke & Chemical Co. the construction of a coke and iron plant at Granite City, Ill., has become a certainty. The foundations for 80 Roberts by-product coke ovens are, in fact, now being laid and the contract for the erection of a 500-ton blast furnace has been awarded to Freyn, Brassert & Co., engineers, Chicago. The Roberts process of producing coke from low-grade Illinois and Indiana coals has been tried out at a plant at Canal Dover, Ohio. A portion of the coke which the company will produce will be used in the blast furnace and the remainder, together with the by-products, will be sold on the open market. The blast furnace will produce pig iron from ore obtained from the Lake region and elsewhere, and the major portion of its output will be used by the Granite City Steel Works owned by the National Enameling & Stamping Co., St. Louis. The company has a broad license for the construction and operation of by-product coke ovens under the Roberts patents, owned by the American Coke & Chemical Co., which has a controlling interest in the new corporation. The Roberts process is unique in that it produces metallurgical coke from the so-called non-coking coals of the Illinois and Indiana fields.

The directors of the St. Louis Coke & Chemical Co. include F. B. Richards, M. A. Hanna & Co., Cleveland; Arthur Roberts, inventor of the Roberts coke oven process, Chicago; George W. Niedringhaus, president, National Enameling & Stamping Co., St. Louis; Clement Studebaker, president, Studebaker Brothers Trust, Chicago; George M. Studebaker, vice-president, Studebaker Brothers Trust, Chicago; George B. Hagerty, treasurer, National Enameling & Stamping Co., St. Louis; John Henry Hammond, Brown Brothers & Co., New York; Breckinridge Jones, president, Mississippi Valley Trust Co., St. Louis; Scott Brown, managing director, Studebaker Brothers Trust, Chicago; George T. Buckingham, attorney, Chicago; L. E. Fisher and Fred C. Orthwein, St. Louis.

The officers are Clement Studebaker, president; Arthur Roberts, chairman of executive committee;

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George W. Niedringhaus, vice-president; George T. Buckingham, vice-president and general counsel; Scott Brown, secretary and treasurer; W. G. Maguire, assistant secretary in charge of sales; L. E. Fisher, general manager; M. W. Ditto, consulting engineer; C. S. Lomax, chief engineer in charge of operations, and A. C. Barclay, controller.

American Vanadium Co. is Sold

The American Vanadium Co., 120 Broadway, New York, of which J. Leonard Replogle, former director of steel supply of the War Industries Board, is president, has been sold to a syndicate consisting of Mr. Replogle, Charles M. Schwab, Allan A. Ryan & Co.; E. R. Tinker, vice-president of the Chase National Bank, New York; Ledyard Cogeswell, an attorney of Albany, N. Y., and Joseph De Wyckoff, European representative of the company. The name has been changed to the Vanadium Co. of America, Inc. All of the assets of the American Vanadium Co., which include large deposits of vanadium in the Peruvian Andes, pass to the new company, which will have a capital of 280,000 shares of stock of no par value. There is no bonded debt. The Peruvian mines are now being supplied with new equipment and will be worked more energetically. The office of the new company will continue at 120 Broadway, New York, and Mr. Replogle will, in addition to his duties as president, continue in charge of the sales.

LINE AND STAFF ORGANIZATION

The System as Applied by the Burroughs Adding Machine Co.

DETROIT, Aug. 25.—The Burroughs Adding Machine Co., of Detroit, has just completed the application to its factory management of a modified form of so-called "line and staff" organization. The principles and methods involved have been applied in a manner in many respects entirely new and in all respects with an effectiveness that makes them of exceptional value. The company hopes by this means to increase its output by 50 per cent the forthcoming year.

W. J. Kilpatrick, factory manager, who is chiefly responsible for the adaptations involved in the new plan of organization, says: "We have brought our mechanical equipment to a high state of refinement, and our schools bring the workmen to a high state of efficiency, so we thought it was time to apply ourselves toward increasing the efficiency of the administrative force."

The system of organization is not new in itself, having been outlined about three years ago in textbooks on administration engineering, but many changes and improvements have been made. So-called line organization is similar to that of the army, wherein each executive obeys the orders of his immediate superior,

they advise. But the committee also includes executives from farther down the scale, chosen for their ability or special knowledge. Thus in matters of betterment any man with ideas sooner or later can go over the head of his immediate superior and "put across" his ideas.

Establishment of the line and staff system necessitated a reorganization of the factory executive staff from top to bottom, owing mostly to the fact that a change was made from seven to twelve factory divisions, entailing the creation of many new executives to head new divisions and the departmental subdivisions of each division. Thus many experienced executives were advanced and many inexperienced men took executive jobs.

While the staff feature of the organization helped greatly in bringing these men to efficiency by means of the conferences involved, it was felt that something more should be done to ascertain whether they understood their work, and if they did not to help them to learn. Here an idea believed to have originated with Mr. Kilpatrick was applied.

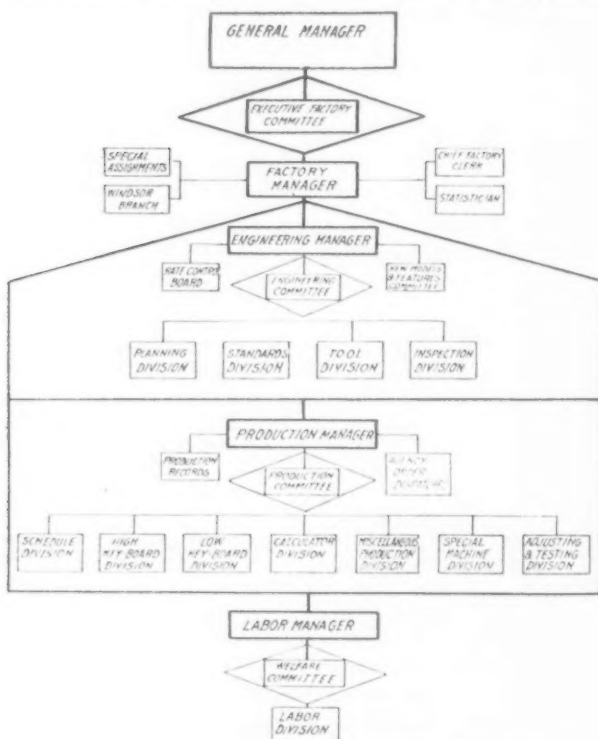
The head of each factory division was required to write a thesis concerning the work of his division. It was believed that if an executive knew his job thoroughly he knew it well enough to write intelligently about it. The theses were to outline the organization of each division, the duties of its personnel and instructions on routine. In other words, the executive was required to put into words and diagrams about everything of importance to be known about his division, at least in so far as that knowledge would be of value in administering the operation of the division.

After a number of conferences in which the men were told what was wanted of them, the theses were prepared and turned in. It was discovered that each man had put into a book of approximately 100 typewritten pages a vast fund of practical knowledge. The work of the divisions was outlined briefly but pointedly, showing that the executives understood every operation involved and the duties of every person connected with each operation. The papers showed how the various departments of each division co-ordinated and how the divisions co-ordinated with each other. The diagrams showed the lines of authority within each division and also the routes of material through the various factory departments.

As to what the writing of these essays had accomplished for the division executives themselves and for factory efficiency there never was any doubt. The necessity of writing about their work had forced the division executives to think about their jobs and straighten out in their minds every detail of the work. This put an end to haziness over scope of authority and duties. It ended confusion and duplication of effort. It defined for each man his special responsibilities. It made the executives, so far as any outside influence could do so, measure up in every case to their jobs; brought them to the top, where they could look around for opportunities of improvement in methods and organization. This because it enabled executives to lay upon subordinates work that otherwise would have occupied their own time. The ultimate results soon showed in a big jump in production, owing chiefly to the smoothness with which the organizations, both office and factory, began to run.

These twelve theses are now being studied by the factory manager and his advisory staff with a view to establishing a single standard set of factory routine instructions, so far as such a thing is possible.

It was foreseen that if the standard instructions were to remain unchanged, as time passed changes in operating conditions would render them obsolete. To prevent this, it is required that every two weeks or thereabouts every division executive shall bring the departmental foremen of his division together for a conference. The improvements and changes in methods and organization worked out at these meetings must be used by the executive in revising his thesis. This revision takes the form of a report of each meeting, made direct to the factory manager. Thus the standard instructions may be kept up to date. Moreover, the



Organization Plan of the Burroughs Adding Machine Co.

without direct recourse to any superior of higher degree. Staff organization, in this instance, consists of a group of experts chosen for the purpose of discovering and standardizing better ways of performing certain functions of the plant. Thus a line and staff organization is a line plus a staff organization.

The accompanying illustration shows the organization plan. At the top is the general manager of the Burroughs company. The space below represents the executive factory committee, whose function is to advise the general manager. The major line of authority passes around this committee to the factory manager. In turn the major line of authority passes down to the heads of the three factory administrative groups, the engineering manager, the production manager and the labor manager. These managers in turn have their advisory committees, without any function save to advise, the minor lines of authority going around and down to the division executives. These division executives in turn have their subordinates, who are foremen of departments.

The advisory committee in each case comprises the executives immediately subordinate to the official whom

factory manager, by constructive criticism, may help each minor executive to become more efficient.

There is yet another important function of the new system of organization that has merely been touched upon. This is what the system means to the individual executive. This function provides means for discovering which members of the entire organization are fitted

for advancement in position and salary. The reports of the divisional executives show the factory manager what the foremen are doing. The advisory committee work keeps the group executives in touch with the divisional executives, and so on up to the top. Advancement comes when the individual merits it, and not when some one guesses he should be advanced.

Heat Treatment of French High Explosive Shells

Absence of Chemical Specifications—American Steel Rounds Used—Application of Taylor System

—BY G. B. WATERHOUSE—

AN interesting book has been received recently in this country, published in January, 1916, by the *Revue de Metallurgie*, Paris, but held confidential until the armistice was signed. It contains a long report on the heat treatment of 75-mm. high explosive shells and the proper arrangement of a plant. The author is Leon Guillet, and there is a preface with notes by Prof. Henry Le Chatelier.

The work was carried out from July 1 to Oct. 1, 1915, at the Penhoet ship yards, Saint Nazaire, and the report was distributed to those interested by Monsieur Thomas, at that time Under Secretary for Artillery and Munitions.

It is very interesting to read this careful report written by two of the foremost French metallurgists. It gives an evidence of the vigor with which the French attacked the problems of war, and is of particular interest because Dr. Guillet says the work was nothing more than "the application of the Taylor system to the treatment of shells." It is in one way merely another instance of how the Taylor system and method has appealed to the logical French mind.

American Steel Used

Another reason why this book is of great interest is because the steel going into these shells came, very largely, from the United States. The French rounds, known generally as 82-mm. rounds, were rolled at many of the steel mills here, even up to the beginning of this year.

The report is long because everything is described with great detail. It covers 154 pages. It is well written, and at each step clear conclusions are drawn, so that it must have been of great service to the various plants making and treating shells.

The main method of testing the treated shells was the standard Brinell test with 3000 kg. pressure and a 10-mm. ball. The first thing was to determine the practicable limits and after many tests it was found that diameters to 3.5 to 3.8 mm. were allowable corresponding to our hardness numbers 302 to 255. A shell was considered satisfactory when it came within these limits and showed no crack either visible to the eye or revealed by the hydraulic or the sound test.

No Chemical Limits Prescribed

Most interesting to us is the section dealing with the chemical composition of the steel. Apparently in France there were imposed no chemical limits, which is a little surprising when it is remembered how closely the composition was watched here. The upper allowable limits for carbon and manganese were found to be carbon 0.45 with manganese 0.70 per cent. The lowest admissible carbon seemed to be carbon 0.30 with manganese 0.45 per cent. It is pointed out, however, that the manganese might be slightly higher as the carbon dropped so that 0.90 manganese was admissible with 0.30 per cent carbon, and on the other hand the carbon might be even lower than 0.30 with manganese up to 0.90 per cent. Later on in the report it is pointed out that with the improved quenching method worked out the carbon might vary from 0.28 to 0.55 and even to 0.60 per cent, and the steel still give good shells.

All the various details of shell making are then gone

into, in order to judge of the influence of the operations before quenching on the heat treatment. The best temperature for heating the lopins or blanks for piercing was found to be 1830 deg. to 2200 deg. Fahr., aiming at 2000 deg. Fahr., and using a reducing atmosphere as far as possible. After nosing the shells should be annealed for one hour at 1560 deg. Fahr., and not at lower temperatures as often used. This annealing, however, can be suppressed if the time of heating before quenching is somewhat prolonged.

Great attention was paid to the question of heating the shells before quenching, and the importance of a regular heating curve pointed out. The furnaces used were heated with gas from coke-fired gas producers. Forty-five minutes as a minimum time for heating was found necessary, and the temperature aimed at was 1560 to 1600 deg. Fahr. It was found very advantageous to hold the shells after leaving the furnace until the temperature had dropped slightly, aiming at 1400 to 1450 deg. Fahr.

The quenching medium used was ordinary water, and a great part of the report is taken up with accounts of experiments with various quenching liquids, and machines for quenching. As mentioned, water was decided on and full working drawings are given of the machine finally adopted. By it 180 shells could be quenched in an hour. A stream of water strikes the inside of the shell at the same time that the outside is flooded with water. The shell is centered accurately in regard to the interior stream, and the shells were held one minute after taking from the furnace before immersion, and quenched for 10 seconds. The temperature of the water was held at 60 to 78 deg. Fahr.

The next point was naturally the drawing. All the shells were first tested with the Brinell machine, and then drawn in a similar furnace to that used for heating for quenching. The best time was found to be one hour and the temperature varied from 800 to 980 deg. Fahr. On leaving this drawing furnace they were quenched in water so that they could be tested immediately. Such shells as proved too hard after this drawing were submitted to a second treatment exactly like the first.

The latter third of the report covers a detailed description of a heat-treating plant built to carry out the rules previously determined. It is freely illustrated with drawings and photographs, and handled about 9000 shells (75 mm.) per day.

German Steel Works Union Disbands

The negotiations which were held on July 25 for renewing the Stahlwerks Verband beyond Aug. 31 have definitely fallen through, according to the *London Iron and Coal Trades Review*. After the withdrawal of the Lorraine and Sarre works, several of the most important Rhineland and Westphalian companies refused to remain in the Verband, although among the works which were in favor of renewal were Krupps, the Phoenix and the Gutehoffnungshütte. From Aug. 1, therefore, each works was expected to sell its semi-finished steel, its sections and railroad material independently, but it is anticipated that the Rhineland-Westphalian works will form a loose convention on the lines of the present Bar Iron Syndicate.

TO PROTECT TUNGSTEN

House Passes Bill, but Final Action Not Expected at Early Date

WASHINGTON, Aug. 26.—The House of Representatives by a vote of 171 to 133 has just passed the Timberlake bill to protect the American tungsten industry. The bill, as passed, provides for a duty of \$10 per unit on tungstic trioxide, crude ores and concentrates. And of \$1 a pound on tungsten contents of metallic tungsten, tungsten powder, ferrotungsten (lump and pulverized) ferrotungsten powder, commercial tungstic acid, calcium tungstate, sodium tungstate, and all other salts of tungsten and manufactured materials containing tungsten, including high speed tungsten steel, all alloy steels containing tungsten and all other compounds containing tungsten.

The unit of tungsten trioxide is defined as "1 per cent of tungstic trioxide in a net ton of 2000 lb."

The bill was passed by a party vote. The minority members offered as a substitute bill a measure which would impose a tariff duty of 10 per cent ad valorem on tungsten ores, and 20 per cent ad valorem on tungsten powder, ferrotungsten and ferrotungsten powder. This was rejected by a vote of 138 to 170.

Because the imposition of these heavy duties would place a premium on the stocks held in this country, the House accepted an amendment offered by Representative Green of Iowa, which would levy a tax on these stocks equivalent to their increase in value. This amendment provides:

"That there shall be levied, assessed and collected upon all tungsten ores and concentrates which have been imported prior to the passage of this act from any foreign country and held or kept within the United States, when such ore has been purchased by the owner thereof at a price less than \$17 per unit of tungsten trioxide therein contained, a tax equal to the difference between the purchase price paid by the owner, and the price named above in this section."

"Ore is coming in here now," said Representative Green, "at least offered for sale at the rate of about \$7 or \$8, and I think there has been a claim that some ore as low as \$6 per unit of tungsten trioxide laid down at New York. The effect of this bill as the committee intended it, will be to bring the price up to about \$17 per unit, which is the lowest price, under the testimony, at which American operators could produce it. Under my amendment, these men that have these large stocks on hand, if they bought it for less than \$17 per unit, will be compelled to pay a tax on the difference between what they paid for it and \$17, and there will be no object in trying to ship in, as doubtless otherwise there would be imported, large quantities of ore at somewhere from \$6 to \$8 a unit, with the hope of making the difference between that and the rate in this bill during the time this bill is pending."

The measure is now in the hands of the Senate Finance Committee. There is considerable likelihood, however, that no action will be taken on the bill before fall. The minority members of the Senate are opposed to any action at this time on tariff measures. They declare that it is now too difficult to secure authentic information concerning production costs abroad.

American Steel Treaters Chicago Convention and Exhibition

The first convention of the American Steel Treaters Society will be held in Chicago, Sept. 23 to 27, 1919, in the Seventh Regiment Armory. The address of welcome will be given Tuesday morning by Hon. Harry H. Merrick, president Chicago Association of Commerce. The program of papers to be presented is as follows:

- A. W. Anderson of C. S. Gordon Co.—"Modern Pyrometry."
- Cyril J. Atkinson, Laboratories, Milwaukee, Wis.—"Metallography of Steel."
- G. A. Brewster, American Steel Foundries, Chicago—"Annealing Large Sections of Cast Nickel Steel."
- Shipley N. Brayshaw, London, England—"Salts for Quenching."
- C. P. Berg, C. P. Berg & Co., Chicago—"Relation of Heat Treatment, Design and Selection of Steels for Metal Cutting Tools to Factory Production."
- Ray T. Bayless, James H. Herron Co., Cleveland—"Results of Investigations Pertaining to Heat Treating."
- R. P. Brown, president, Brown Instrument Co., Philadelphia, Pa.—"Pyrometry."
- Alvin N. Conarroe, chemist and metallurgist, National Malleable Castings Co.—"Cast Steel."
- E. F. Collins, General Electric Co.—"Electric Heating of Steel."
- Wm. G. Conner, Geo. D. Whitcomb Mfg. Co., Rochelle, Ill.—"Case Hardening in General."
- Arthur L. Collins, Atlas Ball Co., Philadelphia—"Heat Treatment of Balls for Bearings."
- D. E. Cornell, Standard Forgings Co., Indiana Harbor, Ind.—"Effects of Forging Temperatures on Heat Treatment of Steels."
- Wm. Geo. Dauncey, associate editor, *Iron and Steel*, Montreal, Canada—"Heat Treatment of Cast Steel."
- Jas. A. Doyle, New York—(1) "The Function of Oil Burners in the Operation of Furnaces." (2) "Factors to be Considered in the Heating and Cooling of Steel."
- C. W. Diemecke, Miehle Printing Press & Mfg. Co., Chicago—"Steels for Projectiles."
- Chas. Elser, Service Station Equipment Co., Chicago—"Case Hardening in General."
- Charles P. Frey, Philadelphia—"A New Compensated Heatmeter."
- Frank P. Fahy, New York—"Steel for Electrical Purposes."
- Frederick J. Griffiths, Central Steel Co., Massillon, Ohio—"Results of Investigations Pertaining to Heat Treating."
- Arthur W. F. Green, John Illingworth Steel Co., Philadelphia—"Heat Treatment of Rifle and Machine Gun Barrels."
- Fred Grotts, Holt Mfg. Co., Peoria, Ill.—"Heat Treatment of Cast Steel in Tractor Construction."
- C. S. Gordon, Claud S. Gordon Co., Chicago—(1) "Fuel Consumption and Its Waste, as Affected by the Proper Use of Pyrometers and Design of Furnaces." (2) "Practical Applications of Pyrometers."
- T. E. Gladden, Tindel-Norris Co.—"Submarine Crank Shafts."
- H. D. Gates, Pangborn Corporation, Hagerstown, Md.—"Sand Blasting."
- Wilfred Hanby, Rotherham, England—"Effect of Heat Treatment and Mechanical Work on Physical Properties of Mild Steel."

N. B. Hoffman, chief chemist and metallurgist, Colonial Steel Co., Pittsburgh—"Heat Treatment of Steels for Chisels."

Carl T. Hewitt, Fafnir Bearings Co.—"Heat Treatment of Ball Bearing Steel."

H. H. Harris, Swedish Crucible Steel Co.—"Controlling the Cost of Pots and Boxes."

Harry E. Hemstreet, Sheldon Axle & Spring Co., Wilkes-Barre, Pa.—"Heat Treatment of Flat Spring Steel" or "Truck Axles and Parts."

L. E. Howard, Simonds Steel Co., Lockport, N. Y.—"Thin Armor Plate."

J. L. Harkness, L-W-F Engineering Co., Inc., New York—"Results of Various Heat Treatments on Alloy Steels as Used in the Structural Parts of Aircraft."

Herman A. Holz, New York—"Recent Developments in the Testing of Steel and Steel Products."

John H. Higgins, Camden Forge Co., Camden, N. J.—"An Investigation on Hot Rolled and Forged Four-inch Steel Bars."

S. C. Johnson, Pelton Steel Co., Milwaukee, Wis.—"Cast Steel and Its Heat Treatment."

John J. Jones, Pressed Steel Car Co., Pittsburgh—"Heat Treatment of Tools for Alternate Contact."

An informal banquet and entertainment is scheduled for 6.30 p. m., Thursday, at the Morrison Hotel. A feature of the convention will be an exhibition of heat-treating equipment of all kinds, the first to be held in this country.

General Motors Improvements

The foundry group for the Samson Tractor Co. division of the General Motors Corporation, Janesville, Wis., will include a gray-iron foundry, core room, sand storage building and pattern shop, and will cover an area of 330 x 530 ft. In addition there will be an 80 x 530-ft. material yard and a 70 x 330-ft. casting storage yard, each served by traveling cranes. Frank D. Chase, Inc., Chicago, which is in charge of the design and construction, is preparing plans for a new heating plant, the first unit of which will have a capacity of 2000 hp., equipped with Sterling boilers and Taylor stokers. Coal will be stored in an inclosed building. It will be delivered to the bunkers above the stokers through a track hopper, crusher and elevating system. The ashes will also be removed by mechanical means, and a crane will be installed to handle the coal and ashes in an emergency, as well as for handling storage coal to the track hopper. The first unit will serve buildings now erected or under construction for the Samson Tractor works, and will be added to as the plant grows. The cost of the project will be over \$1,000,000.

High-Priced Dollars Cut Down Exports

Foreign Machine Tool Business Suffers
Because of the Exchange Situation
—Europe is Buying from Germany

THE dollar is acquiring such strength in relation to foreign standards of value as to constitute a formidable obstacle to the development of export trade. Our allies are sentimentally favorable to the maintenance of intimate trade relations with this country, but with the variations in exchange so great as to mean the addition of anywhere from 15 to 80 per cent to the price, it is not surprising that they place business before friendship. The pound sterling is now quoted at \$4.16, or a decrease of more than 14 per cent from the normal value of \$4.86. The franc and the Italian lira have depreciated to a far greater extent. The dollar is now equivalent to 8.22 francs as against 5 francs 18 centimes under normal conditions. Similarly, the dollar is worth 9.55 lire, or 4.39 lire above the normal exchange basis.

Although these countries are at a serious disadvantage in trading with the United States, they enjoy favorable exchange relations with Germany, the mark having depreciated even more than their own monetary media. It is therefore not astonishing that the allied nations, as well as the neutrals, are buying from our defeated adversary. Whereas normally a mark is worth 23.6c., Italy is purchasing German products at an average exchange rate of 15½c. to the mark, Holland is buying at the rate of 16¼c. to the mark, Switzerland and Scandinavia at from 12½ to 13c. to the mark, and Spain at from 7½ to 8½c. to the mark.

Exchange Encourages German Tool Business

German competition is a serious obstacle in the way of the development of American trade in machine tools. The present selling prices of standard tools manufactured in Germany are practically the same as those prevailing in the United States, calculated on a normal exchange basis. In some cases, in fact, German prices are higher, possibly because manufacturers desire to protect themselves against further declines in the value of the mark. Under present exchange conditions, however, few American machines can compete with the German products.

How the depreciation of the mark is throwing business to the Teutons can best be illustrated by citing the experiences of an important American exporter in connection with a number of purchases of machinery by European countries. This firm had an inquiry for four combination punching and shearing machines to be installed at a shipyard in Rotterdam. After the prospective purchaser received the original quotation, he cabled the American company for the maximum discount which it could grant on the quoted list prices and was advised that the best figure which it could offer was \$5,320 c.i.f. Rotterdam, or about 22,500 marks at the normal rate of exchange of 4 marks 23 pfennigs to the dollar. The machines, however, were purchased from a German firm for 27,000 marks, or the equivalent of 16,000 marks at normal exchange.

The same American exporter received a cable inquiry from Italy for 20-ft. plate bending rolls with 1¼-in. capacity. The first price quoted was \$26,000 delivered, but when it was learned that there was keen competition from British and German manufacturers and that the equipment could be simplified to permit a reduction of \$4,000, a second quotation of \$22,000 was forwarded. On account of the present exchange rela-

tions, however, the order was awarded to a German bidder at less than \$15,000.

A sales engineer representing the American firm, who made an extensive trip through Switzerland about three months ago, tried to secure an order for selective head engine lathes from a leading Swiss manufacturer. The sizes in which the customer was particularly interested called for a 22-in. swing and a 10-in. bed. The American price quoted was \$2,250 per machine, but the order went to a leading German lathe manufacturer at \$1,325 on account of the present low exchange of the mark.

Export Outlook Dark

The exporter who has had the aforementioned experiences as well as others of a like character, is admittedly pessimistic regarding the trade outlook in Europe. French business men who have visited this country have frankly told him that they would be glad to purchase American products even if compelled to pay from 20 to 25 per cent more than the prices quoted on the same products by Germany or Great Britain. However, with the present exchange rate at 8.22 francs to the dollar, as against an exchange of 2 marks 20 pfennigs to the franc, or better, France would have to pay from 50 to 60 per cent more for American than for German products—a difference which no degree of friendship for this country can bridge.

Reports received by the American exporter from his sales engineers abroad indicate that the Germans are also cutting heavily into the British trade to the consternation of British industry. Because of this situation, many bankers are of the opinion that the English would not look with disfavor on a further decline in sterling exchange, even if it fell as low as \$4 to the pound.

What Are the Remedies

Discerning American financiers have been aware of the consequences of the depreciation of foreign moneys for some time and have made efforts to meet the situation. Several weeks ago, H. P. Davison of J. P. Morgan & Co. evolved a remedy calling for assistance by the Treasury Department of the United States. This scheme, however, was rejected by the Federal Reserve Board.

Rumors are current that if French exchange is stabilized in this country, the minimum rate will be not less than 7 francs to the dollar. The American exporter whose experiences have been described is of the opinion that even if this is done, he will be little better off than before, as the average French business man with whom he has had dealings is not willing to do business at an exchange in excess of 6 francs 25 centimes.

In the absence of any effective efforts to remedy the exchange situation, American exporters are in a quandary. Possibly the solution lies in a plan which is reported to have been adopted by certain American grain shippers. In accordance with this scheme, sales are being made on the basis of 6.25 francs to the dollar and the returns are being held in French branches of American banks pending an appreciation of the franc to somewhere near its normal strength. The Belgian commission now in this country to purchase machine tools has also proposed a plan to overcome the present

unfavorable exchange. As reported in *THE IRON AGE* of Aug. 21, this body hopes to induce the United States to take three-year notes in payment for purchases of Government machine tools, the assumption being that the exchange situation will rectify itself before the date of maturity. Obviously both these plans are available only to American corporations with ample free capital.

July Exports Fall and Exports Rise with High Exchange Rates

WASHINGTON, Aug. 26.—High exchange rates are cutting down the totals of American exports. As a result, the exports in July dropped to \$570,000,000, nearly \$350,000,000 less than the total for June, which broke all records with \$918,000,000. But the total for July is still \$507,000,000 over the exports for July, 1918. For the seven months ending with July, 1919, exports were \$4,618,000,000, against \$3,482,000,000 for the same period a year ago, an increase of nearly 33 per cent. The import totals, however, for July were the biggest in the history of the country. Here the high exchange rates stimulated purchasing. They were still far below the export totals, however, so that trade balances in our favor continued to grow.

July imports were valued at \$345,000,000, as against

\$293,000,000 in June, 1919, and \$242,000,000 in July, 1918. They are the largest imports in the history of American foreign trade, exceeding by \$16,000,000 the previous high record of May of this year. Imports for the seven months ended with July were \$1,955,000,000 in 1919, against \$1,788,000,000 in 1918, an increase in the last year of less than 10 per cent.

The excess of exports over imports was \$225,000,000 in July. In the first seven months of this year exports exceeded imports by \$2,663,000,000—\$969,000,000 more than the excess in the corresponding period of 1918, or an increase of 57 per cent.

The difficulties in the foreign exchange situation have been the subject of repeated conferences among Cabinet officials. Suggestions for a Governmental guarantee of foreign credits, however, have won little favor. The Treasury Department is adhering to its policy that private interests must finance our international trade. Congress, also, has taken no action, although Senator Owen has waged a considerable campaign to secure action on the Edge bill to authorize federal incorporation of international banks, as well as on the measure to create a federal foreign reserve bank, an amendment to the War Finance Corporation Act which would make the billion dollar foreign trade appropriation more readily available.

CANADA'S INDUSTRIES

Hopes of Shipping Steel to Many Foreign Points Are Entertained

TORONTO, ONT., Aug. 23.—Some of the Canadian steel manufacturers are beginning to look around for foreign markets. It is even thought that Canadian steel may find its way to England and South America and perhaps Australia. This new outlook arises from conditions in Great Britain, which have sent the price of steel making to a point which enables American manufacturers to undersell those of England. This unusual situation, arising from the aftermath of the war, carries great possibilities in the readjustment of industrial and trade relations in the world. It may be too soon yet to say that England will be permanently at a disadvantage in the steel trade, but the conditions since the signing of the armistice have been such that some of the Canadian manufacturers think their opportunities for foreign trade may be about to open. The outlet to South America and Australia would be to enter markets hitherto largely supplied from England. It may be presumptuous for a country that imports so much of her steel as Canada does to think of entering foreign markets until the imports into this country are greatly reduced. The answer to this may come in the form of a greatly extended steel industry in the Dominion. The Lake Superior Corporation, Sault Ste. Marie, Ont., is building a large addition to its plant; the Dominion Steel Corporation, Sydney, N. S., is building a new plate mill there at a cost of \$5,000,000 as well as greatly improving its present plant; the Nova Scotia Steel & Coal Co., New Glasgow, N. S., is contemplating extensions; and the Lake Huron Steel Corporation recently formed with head office at Goderich, Ont., is now angling for a site on which to erect a large electric steel plant. Now comes the announcement of another company to manufacture iron and steel, etc., namely, The Consolidated Iron & Steel Corporation, Ltd., 20 King Street East, Toronto, Ont., which proposes to establish a large steel plant at Brockville, Ont. All this may herald a new era in the Canadian steel industry and lead to a great expansion of this trade.

What promises to be another iron and steel industry of importance for Ontario is foreshadowed by an announcement of the incorporation of the Consolidated Iron & Steel Corporation, Ltd., 20 King Street East, Toronto, Ont., with a capital stock of \$8,000,000, backed by Detroit and Toronto interests engaged in the mining business. The company owns two large deposits of iron ore lands, and has opened a large hematite mine

25 miles north of Brockville, at Furnace Falls, Ont., where it has 1500 acres. It is announced that the town of Brockville, Ont., has offered inducements to the company to build a blast furnace there, and this is being seriously considered.

Federal Control of Coal Industry May Be Restored

WASHINGTON, Aug. 26.—Threats of railroad strikes and low production in the coal fields have raised new interest in the possibility of restoration of Federal control of the coal industry. The Fuel Administration formally abdicated its control last spring. Fuel Administrator Garfield, however, specifically retained the right to restore complete control if an emergency should arise. There is no question that the Fuel Administration would have the right to reassert all of the war powers and to maintain the same control over coal production, distribution and prices that it had before the armistice was signed. There are indications that the coal operators would be glad to see such control at this time, particularly because it would help to prevent possible labor troubles. If it repeated previous experience, it would also result in increased prices. Considerable opposition has come from coal consumers. At the same time, Congressional investigation of the whole situation is under way, and hearings begin to-day.

According to the figures of the Geological Survey, the production of bituminous coal slumped to 9,166,000 net tons in the week of Aug. 16 from 9,369,000 tons in the week preceding. This brought the rate of production down again to near the level in the latter part of June. The recent strikes on the railroads and in the coal fields, to which causes the sharp decreases in production the first half of August are largely attributed, have been awakening consumers of bituminous coal generally to the danger of delayed purchases of coal. The lack of market has ceased to be the principal factor limiting production in most districts, and car shortages, or, more broadly speaking, transportation disability, is of the greatest importance. Mine operating time reported lost in the week of Aug. 9 because of car shortage was the highest recorded in any week since March, 1918. Production of bituminous coal in the calendar year to date is now nearly 92,000,000 tons, or 25 per cent behind last year for the same period.

The rate of production of beehive coke continues to gain, the output in the week of Aug. 16 being estimated at 412,500 net tons, a gain over the previous week of 23,700 tons, or 6 per cent.

German Works Under Peace Conditions

Effort to Enlist Outside Capital—Labor Problems a Large Factor—Piece Work Abolished—Copying American Machinery

THE following Berlin letter to THE IRON AGE gives a rather more favorable view of the effort of the iron and steel and kindred trades to resume operations on a peace basis than could be gathered from most of the correspondence of the past two months dealing with industrial conditions in Germany:

BERLIN, GERMANY, July 26, 1919.—Contrary to various reports and all expectations, some of the German iron works are in full swing and fully occupied. Westphalian and Silesian works have more business in hand than they can cope with. The output, however, is inadequate owing to the irregularity of coal supply, apathy of workmen and transport difficulties. Still, business is picking up considerably, as is apparent by the continuous advance in stock exchange quotations.

High Wages, Low Performance

As regards the outlook, confidence is returning, and the most critical time of labor unrest seems past. Piece work is abolished throughout Germany, but under the surface strong forces are at work to restore it. Trade unions and responsibly thinking workmen are, in this respect, in league with the owners. Wages are high—16 to 24 marks for the 8-hour day in the provinces, and a little more in cities like Berlin and Dusseldorf. But such wages are low measured by the international standard. At the present rate of exchange their dollar equivalent is only \$1.50 to \$2 per day. Such wages would not seriously obstruct export business. More serious, however, is the lack of efficiency of the workmen. Output per man is generally estimated at about one-third of the pre-war average. It is hoped, however, that better nourishment will slowly raise this efficiency, and some improvement in this direction is noticeable already.

The employers seem to get the labor question more and more in hand. Their attitude shows more firmness than perhaps is warranted at present. Wisdom is often lacking in the treatment of the labor question on both sides. German employers have not grasped yet what the human factor means in handling this question. Consequently, unmitigated selfishness prevails on both sides.

Copying American Machines

All works have now resumed peace work. After the wild chaos prevailing during the first months, readjustment has made rapid strides. Even firms like Krupp have been able to take up peace work. Naturally, it has mostly been done in a haphazard fashion by firms of the war industry, but at the same time careful preparations are being made to start manufacturing specialties. Krupp's, for instance, are negotiating with the Vickers-Maxim interests and the Timken concerns for manufacturing rights of their products. The old established firms have, of course, taken up their peace production. Many firms are preparing to put new types on the market, but are still delaying this thinking, evidently, that the proper time has not come. Special attention has been given to articles previously imported from the United States and England in the machine tool, agricultural and textile machinery lines. American designs have been copied freely. Plans have been made and preparations started in such secrecy that no one knew what others were doing, and then it came about that popular designs of imported articles have been adopted very often by several firms, who consequently find a strong competition waiting for them for all the trouble they have taken. The Gridley automatic, for instance, has been taken up by not less than seven firms. This is only

one instance of such duplication. More surprises of this kind are expected.

There is much wild talk here of American and English concerns negotiating for the control of German works. It is hard to learn how far they are based on tangible facts. Many astonishing developments are taking form beneath the surface.

German Owners Selling Out

A number of works are on the market for sale and foreign buyers are in evidence. The announcement that a Krupp plant in Munich has been sold to an American concern has gone through the press without finding contradiction. Large blocks of shares in great Rhenish steel works have changed hands lately, and the transfer could be traced to Dutch buyers acting on behalf of American concerns. This applies especially to such well-known works as Hösch, Phoenix in Rhineland, and Bismarckhütte in Silesia.

Foreign buyers find much encouragement among German owners who are in many cases anxious to part with control to shift the burden of responsibility to foreign owners. As matters stand, the nationalizing of the iron and steel industry seems a matter of remote probability, but the desire is evidently to so internationalize German industry as to make nationalization quite impossible in all future. The German manufacturers have recovered a good deal of their former strong position, but they seem out to make doubly sure, and so interweave the German industry with foreign threads that it would be hopeless to attack their position again. No doubt the low rate of money offers many attractions to foreign buyers, as they can acquire works here in full running order for about one-third of their international value. They, too, do not find the wages too high, and seem to think that American methods of management will soon raise the workmen's efficiency.

Opportunities in Austria

A large opportunity offers itself in this respect in German Austria. Labor is much cheaper there than in Germany. The Austrian is a good, diligent worker under efficient management. He earns now from 2 to 3 crowns per hour, corresponding to 8 to 11 cents. There are numerous entirely undeveloped water-powers which in the case of Syria are quite in the vicinity of large ore deposits. This is the country whence come the well-known Böhler and Phoenix products. The works there are independent of coal supply, an item of considerable importance. Factories conducted on American principles should be able to turn out work there at an unequalled low cost. This aspect is of a rather disquieting nature to the manufacturing world in general, especially as German Austria will be politically not much more than a foreign dependency, and give the foreign owner a sure footing. Enterprising American firms are very busy there already investigating business opportunities. They are large, considering the low cost of production and the large open market of eastern Europe.

Damage to Belgian Iron Industry

WASHINGTON, Aug. 26.—Damages to the iron industry in Belgium have been estimated at \$213,747,500 by the Belgian Central Commission, and its report has been forwarded to the Department of Commerce by Trade Commissioner H. T. Collings, who is at Brussels. The total amount to industrial plants in Belgium is \$1,549,500,500. This figure is based on prices at the end of April, 1919, converted to dollars at the normal exchange of \$0.193 to the franc.

Iron and Steel Markets

EXPORT TRADE STANDS OUT

Strike Movement Has Not Gained

Large Orders for Car Repair—Proposed Tariff on Ferromanganese

Nothing in the events of the week has changed the judgment of the steel trade that the strength of the strike movement engineered by the American Federation of Labor has been greatly overstated. The number of men voting has been carefully suppressed. The President's stand against a sweeping railroad wage advance has not helped the steel strike drive. If steel works mechanics strike, they may shut down some departments, but the large majority of mill workers are opposed to being thrown idle.

A significant development was the action of representatives of Midvale Steel & Ordnance Co. employees, gathered in their quarterly meeting, in declaring against a shorter day's work and an increased wage, and calling for "increased production and the stabilization of prices in conformity with wages now being paid."

Neither manufacturers nor consumers of steel appear to be taking any of the safeguarding steps as to stocks or shipments of materials that are commonly seen when a strike is considered imminent.

At one Eastern and one Western steel plant eight-hour turns have just been granted, but at the former the output went down because enough men could not be found for three shifts.

Export trade made up of so many kinds of material in moderate and small tonnages that its magnitude is scarcely appreciated, is still expanding. The Orient, South America and neutral countries of Europe are good buyers, while business with Allied Europe waits. Japan and the South African Government are buying railroad equipment here, the latter ordering 500 gondola cars. One large steel export company has found its August business the best of the year.

Car repair work is coming up in the absence of new railroad equipment orders. The Pennsylvania Railroad asks bids on 5000 hoppers for old trucks, the whole requiring 50,000 tons of plates, shapes and bars. The Chesapeake & Ohio will repair 2000 cars, and a Connellsville road 700. For the Union Tank Line Co. 1000 tank cars are to be bought and the Mexican Petroleum Co. will buy 600. The largest structural contract of the week is 4000 tons for the Hotel Linnard, New York.

The recent cut by a Pittsburgh mill to 2.50c. on plates for the Navy and to 2.40c. on shapes has not carried the commercial market to that level. However, the \$2 per ton extra for Lloyds' inspection of ship plates is being waived. One Eastern plate mill has taken 20,000 tons for export in the past fortnight, chiefly to Japan.

A western Pennsylvania mill has advanced its

price for bars to 2 50c., or by \$3 a ton, and on hoops and bands to 3.20c., Pittsburgh, in view of large bookings. However, the general policy in opposition to advances holds and has been accentuated by the country-wide movement for lower commodity prices.

An inquiry is up for 300,000 boxes of tin plate for the Orient and another export item is 150,000 boxes. From some important districts vegetable canning demand for tin plates has fallen off, due to excessive rains, but California is calling for much more than usual. For oil cans consumption is on a very large scale.

The report that the German Steel Works Union will not be renewed has an old-time sound, but it does not signify in the old way. Since the resignation of the Rheinische Stahlwerks still stands, the union is expected to dissolve Sept. 30, but at that it is scarcely 50 per cent of the former union.

England has taken further lots of Lorraine pig iron from the French authorities. American billets have been quoted in Great Britain at £12 13s. c.i.f. In the Chicago district 20,000 tons of billets have been sold for export.

British steel exports are growing slowly. For the first half of the year they were about 1,000,000 tons, against 800,000 tons in the same period last year. Galvanized sheets account for 150,000 tons, or three-fourths of the gain.

Foundry pig-iron wants have now been well covered for this year and labor and railroad freight uncertainties figure so largely in 1920 deliveries as to hold such business back. An interesting feature in the Chicago district is the sale of some lots of Canadian pig iron carrying \$3.30 freight, as against \$5 for Southern iron.

The Tariff Commission is canvassing the steel industry on the proposed duty on ferromanganese, as much as 75 cents a unit or \$60 a ton, which is palpably prohibitive, having been urged. The British producers are naming prices here under \$100, indicating a determined effort to retake the American market. Domestic production is down to the pre-war basis of about 10,500 tons per month, after going beyond 28,750 tons per month in 1918.

Pittsburgh

PITTSBURGH, Aug. 26.

The action of President Wilson in refusing to grant railroad employees the heavy advance in wages asked for, but agreeing to raise shopmen 4c. per hour, it is believed, will have a very wholesome effect on the labor situation, which is regarded as critical all over the country. Locally, there have been no labor disturbances or strikes, with the exception that the entire system of the Pittsburgh Railway Co. has been tied up by a strike for nearly two weeks, and an attempt of the company to operate cars on Monday this week resulted in serious disorder and injury to a number of persons.

William Z. Foster, secretary and treasurer of the national committee for organizing iron and steel workers, is in New York this week, but at the offices of the

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron,

Per Gross Ton:	Aug. 26, 1919	Aug. 19, 1919	July 29, 1919	Aug. 27, 1918
No. 2 X, Philadelphia...	\$29.60	\$29.60	\$29.60	\$34.40
No. 2, Valley furnace...	26.75	26.75	26.75	33.00
No. 2, Southern, Cincin...	31.10	31.10	28.35	36.60
No. 2, Birmingham, Ala...	27.75	27.50	26.75	33.00
No. 2, furnace, Chicago*	26.75	26.75	26.75	33.00
Basic, deliv., eastern Pa.	26.60	26.60	26.60	32.90
Basic, Valley furnace ..	25.75	25.75	25.75	32.00
Bessemer, Pittsburgh ..	29.35	29.35	29.35	36.60
Malleable, Chicago*	27.25	27.25	27.25	35.50
Malleable, Valley	27.25	27.25	27.25	33.50
Gray forge, Pittsburgh..	27.15	27.15	27.15	33.40
L. S. charcoal, Chicago..	32.75	32.75	31.75	37.85

Rails, Billets, Etc.,

Per Gross Ton:	Aug. 26, 1919	Aug. 19, 1919	July 29, 1919	Aug. 27, 1918
Bess. rails, heavy, at mill	45.00	45.00	45.00	55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh.	38.50	38.50	38.50	47.50
O.-h. billets, Pittsburgh.	38.50	38.50	38.50	47.50
O.-h. sheet bars, P'gh...	42.00	42.00	42.00	51.00
Forg. billets, base, P'gh.	51.00	51.00	51.00	60.00
O.-h. billets, Phila.....	42.50	42.50	42.50	51.30
Wire rods, Pittsburgh...	52.00	52.00	52.00	57.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.745	2.745	2.745	3.73
Iron bars, Pittsburgh....	2.75	2.75	2.75	3.50
Iron bars, Chicago.....	2.62	2.62	2.62	3.50
Steel bars, Pittsburgh....	2.35	2.35	2.35	2.90
Steel bars, New York....	2.62	2.62	2.62	3.145
Tank plates, Pittsburgh..	2.65	2.65	2.65	3.25
Tank plates, New York...	2.92	2.92	2.92	3.495
Beams, etc., Pittsburgh..	2.45	2.45	2.45	3.03
Beams, etc., New York...	2.72	2.72	2.72	3.245
Skelp, grooved steel, P'gh.	2.45	2.45	2.45	2.90
Skelp, sheared steel, P'gh.	2.65	2.65	2.65	3.25
Steel hoops, Pittsburgh...	3.05	3.05	3.05	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,

Per Lb. to Large Buyers:

	Aug. 26, 1919	Aug. 19, 1919	July 29, 1919	Aug. 27, 1918
	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	4.35	4.35	4.35	5.00
Sheets, galv., No. 28, P'gh.	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh...	3.25	3.25	3.25	3.50
Cut nails Pittsburgh.....	4.925	4.925	4.25	4.00
Fence wire, base, P'gh...	3.00	3.00	3.00	3.25
Barb wire, galv., P'gh...	4.10	4.10	4.10	4.35

Old Material,

Per Gross Ton:

Carwheels, Chicago	\$26.00	\$26.00	\$25.00	\$29.00
Carwheels, Philadelphia..	24.50	24.50	24.00	29.00
Heavy steel scrap, P'gh...	20.00	20.50	21.00	29.00
Heavy steel scrap, Phila..	19.00	19.00	19.00	29.00
Heavy steel scrap, Ch'go.	20.00	20.00	21.00	29.00
No. 1 cast, Pittsburgh...	23.50	23.50	22.50	29.00
No. 1 cast, Philadelphia..	25.00	25.00	22.50	29.00
No. 1 cast, Ch'go, net ton.	24.00	24.00	24.00	33.00
No. 1 RR. wrot., Phila...	26.50	26.50	25.00	34.00
No. 1 RR. wrot., Ch'go, net	19.00	20.50	20.50	29.75

Coke, Connellsville,

Per Net Ton at Oven:

Furnace coke, prompt....	\$4.85	\$4.50	\$3.85	\$6.00
Furnace coke, future	4.12	4.12	4.12	6.00
Foundry coke, prompt....	5.50	5.50	5.00	7.00
Foundry coke, future	5.50	5.50	5.00	7.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	24.00	24.00	23.75	26.00
Electrolytic copper, N. Y.	23.50	23.50	23.50	26.00
Spelter, St. Louis	7.60	7.75	7.80	9.25
Spelter, New York	7.95	8.10	8.15	9.50
Lead, St. Louis	5.75	5.75	5.75	7.75
Lead, New York	5.90	5.90	6.00	8.05
Tin, New York	56.00	57.00	70.00	88.00
Antimony, Asiatic, N. Y..	9.25	9.25	9.37½	14.25
Tin plate, 100-lb. box, P'gh.	\$7.00	\$7.00	\$7.00	\$7.75

organization in the Magee Building claims are being made that the vote which closed on Aug. 20 was almost unanimously in favor of a general strike. However, the number of persons voting is not stated. It is known positively that at many iron and steel plants the only men voting were the foreign element, and many of them probably did not realize what their votes meant. The action of the employees at the Vandergrift, Pa., works of the American Sheet & Tinplate Co., in holding a mass meeting and unanimously repudiating the action of labor agitators in trying to force a strike no doubt largely represents the sentiment of the intelligent employees at all the plants of this company. Heads of the large steel companies here do not expect a general strike, but there are no means of knowing yet how the actual vote resulted. One thing is certain, and that is that if the men at any of the steel plants of the large companies vote for a strike that plant will be closed down at once, and will remain idle until the men decide to work. There is a good deal of nervousness over the labor outlook, but there are some who believe the crest of the wave of unrest has been reached, and that very soon the labor outlook will be a good deal better.

The volume of business in iron and steel products so far in August has not been as heavy as earlier in the year, but this is largely because of the fact that many consumers and jobbers placed their contracts in May and June, on which they are specifying freely. Output and shipments so far this month have been fully as heavy as in the same time last month, or larger. Changes in prices have been very few, the large steel interests being strongly against any advances, partly because of the effect on labor. Small spikes have gone up, and furnace coke has advanced probably 75c. a ton, owing to heavy demand and high prices of coal, some coke producers preferring to sell their coal rather than make coke.

The scrap market is quiet, and some grades are off

50c. a ton. Pig iron and steel makers are opposed to selling into next year, owing to the uncertainty as to production costs. Labor may be higher, and a stiff advance may come in freight rates, and these possibilities are being carefully considered. The demand for sheets and tin plate, wire products, line pipe and oil well tubular goods is still very heavy, and far beyond the ability of the producers to furnish as fast as needed. However, any official advances in prices, except in isolated cases, and by a few producers to stave off taking orders, are not considered likely.

Pig Iron.—Inquiry has quieted down in the past week, most consumers now being well covered on their needs for the remainder of this year, and furnaces are strongly opposed to selling into next year on account of the uncertainty as to production costs later in this year, and early in next year. There have been some sales of No. 2 foundry for this year delivery at 50c. per ton above the regular price of \$26.75 Valley, or at \$27.25 at maker's furnace. The Pennsylvania Railroad has an inquiry out for 1000 tons of car wheel iron for its Altoona, Pa., shops. Several furnaces upon being pressed into selling iron for next year quoted an advance of \$2 a ton over present prices, and negotiations stopped. Furnace coke has gone up 75 to 85c. per ton in the past two weeks, and this has added strength to prices on pig iron. One furnace company is reported to have paid as high as \$4.85 for furnace coke for prompt shipment. It is not believed that regular prices on pig iron could be shaded even for very desirable tonnage. The Carnegie Steel Co. is now operating 49 of its 59 blast furnaces and will blow in two or three more as soon as they are ready. This company is operating this week close to 90 per cent of steel ingot capacity. Prices of pig iron are very firm and we quote:

Basic pig iron, \$25.75; Bessemer, \$27.95; gray forge, \$25.75; No. 2 foundry, \$26.75; No. 3 foundry, \$26.25, and malleable, \$27.25; all per gross ton at Valley furnaces, and freight rate for delivery in the Cleveland and Pittsburgh districts being \$1.40 per ton.

Ferroalloys.—Except for a 2000-ton inquiry from Youngstown, inquiry for ferromanganese is mostly for carload lots. The inquiry for spiegeleisen is light and also for 50 per cent ferrosilicon. There is no change in prices of the lower grades of Bessemer ferrosilicon, but one or two makers of silvery iron are asking \$2 higher.

We quote 78 to 82 per cent domestic ferromanganese at \$110 delivered, with a reduction of \$1.50 to \$1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at \$85, and 18 to 22 per cent spiegeleisen at \$32 to \$35, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, \$47.75; 10 per cent, \$49.75; 11 per cent, \$53.05; 12 per cent, \$56.35. We quote 6 per cent silvery iron, \$36.75; 7 per cent, \$38.50; 8 per cent, \$40.25; 9 per cent, \$42.25, and 10 per cent, \$44.75. About \$3 per gross ton advance is charged for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of \$2.90 per gross ton for delivery in the Pittsburgh district.

Billets and Sheet Bars.—The shortage in supply of sheet bars is growing more acute right along, and reports are that premiums of \$1 to \$2 per ton over the regular price have been paid for sheet bars for prompt delivery, but this is not confirmed. Some sheet and tin plate mills are not able to get sheet bars fast enough, and the situation is likely to get worse, largely because of a lack of skilled labor in the steel mills. There is considerable export inquiry for billets and sheet bars. Prices are very firm and we quote:

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$38.50, 2 x 2 in. billets at \$42; sheet bars, \$42; slabs, \$41, and forging billets, \$51 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Steel Rails.—Very little is being done in standard sections, but the demand for light rails is active, largely from the coal mining interests. The Cambria Steel Co. has sold a few odd lots of standard sections, ranging from 100 to 200 tons, on the basis of \$55 for Bessemer and \$57 for open hearth stock. These prices are \$10 per ton above those fixed at the conference in Washington, and effective from March 21. Prices on light rails remain at 2.45c. for 25 to 45 lb. sections, 2.49½c. for 20 and 16-lb. sections, and 2.54c. for 12 and 8-lb. sections, f.o.b. Pittsburgh.

Structural Material.—The amount of new business entered by the fabricators in August so far is considerably less than in the same time in July. Inquiry is heavy, but new work is slow in being closed. No contracts of moment were closed in this district in the past week, and some of the fabricating shops are in need of work and are naming very low prices erected. We quote plain material at 2.45c., Pittsburgh.

Plates.—The fact that the Carnegie Steel Co. quoted 2.50c., Pittsburgh, on 26,000 tons of plates, for battle-ships 49 and 50, has unsettled the plate market to some extent, both large and small buyers of plates at once asking their sources of supply that this price be made to them. Local plate mills report they have refused these requests in all cases, and state they are holding plates at the regular price of 2.65c. at mill. The demand is only fair, no new business coming from the steel car companies, as they are not getting any orders for cars. Reports that the American Car & Foundry Company had taken contracts for 18,000 cars for export are said here to be absolutely untrue. We quote ¼ in. and heavier tank plates at 2.65c., Pittsburgh, but it is likely this price is shaded from \$1 to \$2 per ton in some cases.

Iron and Steel Bars.—The Cambria Steel Co. has quoted lately 2.50c. for steel bars for fairly prompt or for extended delivery. The company is well sold up, and this is true of all the steel bar mills. The demand is heavy and specifications on contracts are coming in freely. The demand for iron bars is active, and an early advance in prices is not unlikely.

We quote steel bars, rolled from billets, at 2.35c., and from old steel rails, 2.45c. Pittsburgh mills rolling iron bars quote at 2.75c., Pittsburgh, plus full freight rate to point of delivery.

Sheets.—The demand for all grades of sheets continues very heavy, and leading mills are well sold up over the remainder of this year. Several large makers report that so far this month they have specifications

fully 50 per cent or more in excess of production. Many large consumers, notably automobile builders, are now trying to have mills duplicate contracts placed some time ago, but in most cases are informed that this cannot be done, as the mills are so well sold up they can not possibly get out the tonnage. The general average of operations among the sheet mills is about 90 percent. It is said that in some cases premiums in prices have been paid to some mills for galvanized sheets for prompt shipment. Prices on sheets are given on page 611.

Tin Plate.—Official reports from Maryland are that the tomato crop in that state this year is a partial failure, due to the excessive wet weather, and will probably not be more than 25 to 50 per cent of normal. If the first frosts this year should be late, it may help the situation, but just now it seems that the consumption of tin plate by consumers in Maryland will not be more than 50 per cent of normal. However, this condition in Maryland is largely offset by the very heavy demand for tin plate from canners in California and other Pacific States where the pack of salmon and other fish, also the crop of fruit and vegetables, will be very much heavier than ever known. The demand for tin plate is fairly active, and three or four of the leading makers say their output for this year is practically sold, and specifications are coming in very freely. Operations average probably 95 per cent and one local mill was running 100 per cent four days last week. The export inquiry for tin plate is very heavy, one inquiry alone calling for 300,000 boxes for the Orient and another for 150,000 boxes. Other inquiries ranging from 20,000 boxes up to 50,000 boxes are numerous and indications are that shipments of export tin plate by the mills over the next six months or more will be heavy. We quote production tin plate for domestic use at \$7 per base box, for export, \$6.75 to \$7, and stock items from \$6.50 to \$6.75, most sellers quoting the higher figure. The demand forterne plate is very heavy and most mills are sold up for three to four months. Prices onterne plate, as adopted March 21, last, are given on page 611.

Wire Rods.—The domestic and export demand for wire rods is active. Inquiry is in the market for 1000 tons of soft and high carbon rods for England on which one mill has quoted \$57 for the soft and \$67 for the high carbon rods, f.o.b. Pittsburgh. Owing to the heavy business in wire and wire nails, rod mills that ordinarily sell a good part of their output in the open market are restricting sales of rods, which are needed for their own wire mills. We note a sale of 500 tons of acid rods at \$80, 200 tons of soft rods at \$55 and 100 tons at \$57, the latter two sales being for export. Prices on rods are given on page 611.

Cut Nails.—The demand for cut nails is very active, and the only maker in this district, the LaBelle Iron Works, Steubenville, Ohio, is reported sold up for some time. This company is quoting \$4.75 per keg, base, Wheeling, W. Va., in carloads, an advance of 10c. per keg being charged for less than carloads to which the freight rate to Pittsburgh, 19½c., is added.

Wire Products.—Local mills report they are practically sold up on wire and wire nails for remainder of this year, and are taking only such business as they feel they ought to take from old customers, whose source of supply they have been for many years. Local makers of wire and wire nails report they are having regular inquiries from companies that they have never sold to before. This indicates that the regular sources of supplies of these buyers are not able to handle their business. Shipments and output of wire and wire nails so far in August have been fully as large as in July, but most of the business booked is less, owing to the fact that makers entered large orders in May and June on which they are now making deliveries. It is not believed the American Steel & Wire Co. will make any advances on wire and wire nails, but the Cambria Steel Co., Youngstown Sheet & Tube Co. and the Pittsburgh Steel Co. are still quoting prices higher than those of the leading interest. Another local maker has not officially advanced its prices, but is quoting the same prices as the three companies noted above. Prices are given on page 611, but it should be noted that these

are lower than have been quoted for some time by three or four large makers.

Hoops and Bands.—The demand for both hoops and bands is very heavy, and the Cambria Steel Co. has advanced prices \$3 per ton, or to 3.20c. However, other large makers, such as Carnegie Steel Co., Pittsburgh Steel Co., and others, are still quoting on the old basis of 3.05c. Mills are fairly well filled up, but can still take business for delivery in two or three months. We continue to quote hoops and bands at 3.05c., Pittsburgh, with usual extras.

Spikes and Track Bolts.—Owing to the heavy demand for small spikes, makers are sold up for three and four months. The demand for standard spikes is not heavy, but for boat and barge spikes is fairly active.

We quote standard spikes, 9/16 x 4 1/2 in., at \$3.35, base, per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, 3/4 in., 7/16 in. and smaller, at \$3.85 to \$4 per 100 lb. in carload lots of 200 kegs of 200 lb. each, plus usual extras. Boat and barge spikes, \$3.85 to \$4 per 100 lb. in carload lots of 200 kegs of 200 lb. each, all f.o.b. Pittsburgh.

Hot-Rolled Strip Steel.—Makers report the volume of business is steadily getting larger, both jobbers and consumers desiring to get in as heavy stocks as possible in view of expected labor troubles, which may restrict output later in the year. This increase in demand is coming from practically all classes of consumers. We now quote hot rolled strip steel at 3.30c., Pittsburgh, this price being for strips for deep drawing and stamping purposes.

Cold Rolled Strip Steel.—Makers report the demand is steadily getting heavier, consumers and jobbers buying more freely than for some time.

We quote cold-rolled steel at \$5.65 base per 100 lb., f.o.b. Pittsburgh, for 1 1/2 in. and wider, 0.100 in. and thicker hard tempered in coils 0.20 carbon and under. Boxing charge 25c. per 100 lb.

Cold-Finished Steel Bars.—The recent action of the makers of shafting and screw stock in adopting the policy of quoting net prices on shafting and screw stock instead of discounts created some confusion in the trade, and as a result of this a committee from the American Iron, Steel and Heavy Hardware Association, consisting of A. J. Lockwood and A. H. Chamberlain, secretary of that organization, came to Pittsburgh and held a conference with three or four leading makers, at which the reasons for making this change in quoting were fully discussed, and it is now stated there is very little dissatisfaction among jobbers over the new method of quoting prices. The demand for screw stock is reported by makers to be steadily getting larger, the bulk of the business coming from the automobile trade and concerns that make automobile parts. We now quote cold finished steel bars at \$3.60 for base sizes, 2 1/4 to 3-in. rounds in car load and \$3.85 in less than car loads, f.o.b. Pittsburgh. The full list of extras, adopted by the makers and effective from Aug. 18, was given in full on page 547 of THE IRON AGE of Aug. 21.

Nuts and Bolts.—Makers report the demand is fairly active, and state that the recent advance in prices is being well held. Consumers and jobbers are buying freely, in view of the expected delay in getting material later, due to possible labor troubles. Discounts, as adopted on Aug. 4, are given on page 611.

Rivets.—The demand is reported fairly active and local makers say they are entering more new orders than for some time. We quote large structural and ship rivets at \$3.90 and large boiler rivets at \$4 base, f.o.b. Pittsburgh.

Skelp.—Prices are firm and mills rolling skelp are filled and are not taking any more orders for delivery this year. Prices as effective from March 21 are 2.65c. for sheared steel skelp, 2.55c. for universal and 2.45c. for grooved per lb., f.o.b. Pittsburgh.

Iron and Steel Pipe.—There is no let-up in the demand for line pipe and oil well tubular goods, the mills being congested and turning away desirable business, which they are unable to handle and make the delivery wanted. A recent inquiry for 100 miles of 8-in. pipe has been turned down by four or five mills, and has not yet been placed. One leading mill on oil

well supplies and line pipe is filled up for the year. The demand for merchant pipe and also for butt-weld pipe is steadily getting heavier, and on butt-weld sizes three or four of the larger mills report they are sold up for the remainder of this year. Some mills have considerable business on their books for January and February delivery, but it is said no premiums or advances were exacted on this business. Prices on iron and steel pipe remain very firm, and are given in detail on page 611.

Boiler Tubes.—The demand for merchant and locomotive tubes is reported heavier than for some time. A local mill recently took about one-half of the boiler tubes for the 150 locomotives to be built by the Baldwin Locomotive Works for Poland. There is still some cutting in prices on tubes, some makers not exacting the extras. Discounts are given on page 611.

Coke.—The recent advances in prices on furnace and foundry coke are holding firm, and are due largely to the very heavy demand for coal for by-product coke purposes. No contracts for furnace coke have recently been closed, but high grades of furnace coke for prompt shipment are holding firm at \$4.50 to \$4.75, while on standard grades of 72-hr. foundry coke most producers are quoting \$5.50 to \$6, owing to higher prices of coal. Coke producers say they will not take any more contracts for furnace coke on the six and one-quarter to one basis, and in fact would not think of making a contract for furnace coke at less than \$4.50 per net ton at oven. Some coke producers say they are indifferent about making further sales of coke, and prefer to sell their coal at present high prices. The output of coke in the Upper and Lower Connellsville regions for the week ending Aug. 16 was 236,182 tons, an increase over the previous week of 14,012 tons. The output of coke is now up to what it was in the early part of this year, and about 60 per cent of the Connellsville ovens are active. We note sales in the past few days of fully 10,000 tons or more of standard grade furnace coke for the remainder of this month and early September delivery at \$4.50 per net ton at oven, and it is said that some coke has sold at slightly higher than this price. Some producers are now asking as high as \$4.85 for prompt furnace coke, and claim to have sold some small lots at that figure. Still higher prices on furnace coke in the near future now seem very likely.

Old Material.—The local scrap market has quieted down somewhat, due to the fact that consumers are not inclined to buy scrap very far ahead, owing to the uncertainty of the future as regards labor. Heavy steel melting scrap shows some weakness, but rerolling rails are firm. Turnings, heavy breakable cast scrap and borings are slightly lower. We note sales of 4000 to 5000 tons of heavy steel scrap at \$20.50 to \$21 for delivery in the Pittsburgh district, and 2000 to 3000 tons at \$21 for delivery in the Youngstown district. Also 3000 to 4000 tons of low phosphorus melting stock, consisting of bloom and billet and plate ends at \$25 to \$26 delivered.

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$20.00 to \$20.50
No. 1 cast, for steel plants	23.50 to 24.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	26.50 to 30.00
Compressed steel	18.00 to 19.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	15.50 to 16.00
No. 1 busheling	18.00 to 18.50
Railroad grate bars	18.00 to 18.50
Low phosphorus melting stock (bloom and billet ends, heavy plates) 1/4 in. and heavier	25.00 to 25.50
Iron car axles	31.00 to 32.00
Locomotive axles, steel	31.00 to 32.00
Steel car axles	28.00 to 29.00
Railroad malleable	20.00 to 20.50
Cast iron wheels	23.50 to 24.00
Rolled steel wheels	22.00 to 23.00
Machine shop turnings	13.00 to 13.50
Rolled steel wheels	22.00 to 23.00
Sheet bar crop ends (at origin)	23.00 to 24.00
Heavy breakable cast	19.50 to 20.00
Cast iron borings	14.50 to 15.00
No. 1 railroad wrought	22.00 to 23.00

Chicago

CHICAGO, Aug. 26.

The labor problem still holds the center of the stage, but the steel producers are less pessimistic over the outlook than they were a week ago. It will be recalled that the union organizers announced that they would deliver their ultimatum to the steel interests on Aug. 20. Their failure to take such action up to date is regarded as an indication that the vote in support of a strike was not so large as has been claimed. It is regarded as entirely possible that those employees who cast ballots were overwhelmingly in favor of drastic action, but the question remains what proportion of the total number of iron and steel workers voted. An important local interest reports that practically none of its employees is identified with the union movement.

The foreign workmen, according to admissions by the union organizers, are supporting the strike movement much more generally than the native employees. The mills are confident that the latter, many of whom are returned soldiers, will not submit to any intimidating tactics on the part of the alien workers should a strike be called. The recent change from a two-shift to a three-shift schedule by the In. and Steel Co. is indicative of the harmonious relations existing between that company and its men. The new 8-hr. basis, which involves an increase in hourly rates but a decrease in daily wages, was adopted at the suggestion of the employees through their representatives on the works council.

The leading interest has practically recovered from the partial shut-down forced by the railroad shopmen's strike and is now operating at over 70 per cent of ingot capacity. It now has nine furnaces in blast at South Chicago and 11 at Gary, with one about to blow in at the latter plant. All its open-hearth furnaces are running with the exception of plant No. 1 at South Chicago, which has been undergoing extensive repairs now practically completed. The foremost independent continues to operate on a 75 per cent basis. The dock strike at the upper lake ports came to an end yesterday, when most of the men returned to work. The local building trades lockout is still in effect, but a settlement is now looked for as the result of meetings of all factions involved in the dispute. These conferences, which were arranged by Federal mediators, are the first to take place since the lockout was declared six weeks ago. The market continues strong in most products, although in general individual transactions involve small tonnages. The leading interest has booked a total of 20,000 tons of billets for export. Inquiries and orders for tank cars are increasingly numerous and will mean the placing of substantial tonnages of steel. The demand for pig iron continues active. Although most inquiries are for small amounts, a large steel foundry has ordered 10,000 tons of basic from a local seller. Scrap is dull.

Pig Iron.—The tone of the market is steadily improving because of the diminishing supply of Northern iron available for delivery this year. One Northern seller is out of the market for the remainder of this half and the leading local interest is rapidly approaching that condition. No additional merchant stacks have been blown in, in this district, but they are expected to go in shortly. The large bookings of both Northern and Southern furnaces have encouraged the sale of Canadian iron, which is being delivered here at the Redfield prices plus a freight rate of \$3.30. The rate it will be noted is considerably below that on Southern iron, which is \$5. Most current orders are for small lots ranging from carloads to a few hundred tons. Malleable foundries, which are generally busy as the result of the large requirements of automobile manufacturers, are foremost among purchasers of spot iron. Basic has been active the past few weeks, over 30,000 tons having been sold by local dealers. The most recent purchase, 10,000 tons, was made by the American Steel Foundries. Other sales include one for 1500 tons of foundry. Silvery is much in demand, but is scarce on account of the tie-up of the Jackson County furnaces. There have been no further changes in prices, but

Northern furnaces are not particularly anxious to sell iron with the higher silicon analysis, and it would not be surprising if they raised their quotations on those grades. In fact, it is reported that small lots of the higher silicon iron have been sold at \$1 above the market.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, average silicon, 1.50, second half delivery, f.o.b. furnace, average freight to Chicago, \$2.50 (other grades subject to usual differentials).....	\$30.25
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	28.00
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	26.75
Northern high-phosphorus foundry	26.75
Southern coke, No. 1 foundry and No. 1 soft, silicon, 2.75 to 3.25....	\$34.75 to \$35.75
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	33.60 to 34.60
Southern foundry, silicon, 1.75 to 2.25	32.50 to 32.75
Malleable, not over 2.25 silicon	27.25
Standard Bessemer	27.95
Basic	25.75
Low phosphorus (copper free)	40.00
Silvery, 7 per cent.....	42.05

Ferroalloys.—Outside of the sale of a few carloads of ferromanganese, there has been no activity in the ferroalloys. Spiegeleisen is a little stronger, as some producers are now asking \$40 furnace, maintaining that their costs exceed \$35.

We quote 80 per cent ferromanganese at \$110, delivered; 50 per cent ferrosilicon, at \$80, delivered; spiegeleisen, 18 to 22 per cent, \$35, furnace.

Billets.—The leading interest has booked orders for 20,000 tons of billets for export. Numerous inquiries calling for prompt delivery are being received from abroad, particularly from England, where steel finishing capacity expanded greatly during the war. Local mills are experiencing some difficulty in taking the export business offered, not only because immediate shipments are generally asked for, but because of high freight rates and the decline in foreign exchange. The domestic demand continues active. The foremost interest is temporarily running its heavy rail mill on billets. We quote 4 x 4 in. open hearth billets at \$42.90; 2 x 2 in. billets at \$46.40, and forging billets at \$55.40, delivered Chicago.

Bars.—The demand for soft steel bars continues strong, most inquiries being for small tonnages. Specifications against contracts are heavy and new business is being taken with difficulty, particularly when early delivery is called for. Rail carbon mills have accumulated large backlogs and are still receiving a good volume of inquiries from manufacturers, though the demand for reinforcing bars is diminishing. Bar iron mills are not disposed to book ahead beyond 60 days, as they are now operating on a close margin and fear that costs will increase. Bar iron is firm at 2.62c., Chicago. One or two mills, in fact, are now quoting 2.75c.

Mill prices are: Mild steel bars, 2.35c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.62c., Chicago; rail carbon, 2.55c. mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Sheets.—There has been little change in the situation except that early deliveries are more difficult to obtain than ever.

Mill quotations are 4.35c. for No. 28 black, 3.55c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized. Jobbers quote Chicago delivery out of stock: No. 10 blue annealed, 4.57c.; No. 28 black, 5.62c., and No. 28 galvanized, 6.97c.

Plates.—A Japanese inquiry for 5000 tons of plates has been received by local mills. The domestic demand is receiving an impetus as the result of the rapid expansion of the Southwestern oil fields. Inquiries and orders for tank cars are increasingly numerous. The Union Tank Line Co. is in the market for 1000 tank cars, the construction of which will call for about 8300 tons of steel. Of this tonnage approximately 2500 will be plates, 1000 tons axles and the remainder shapes and bars. Recent bookings of the American Car & Foundry Co. include 600 tank cars ordered by

the Mexican Petroleum Corporation, 200 ordered by the Ohio City Gas Co., 100 ordered by the Imperial Refining Co., and a total of 215 ordered by a number of other concerns. About 3000 tons of steel, mostly plates, for tanks and apparatus for the Beacon Oil Co., Boston, has been awarded by the Leonard Construction Co., Chicago, to the Memphis Steel Construction Co.

The mill quotation is 2.65c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Structural Material.—Although there is considerable work pending, fabricating awards have fallen off somewhat. Local projects are still at a standstill on account of the Building Trades lockout. The mill building to be constructed by the Interstate Iron & Steel Co. at South Chicago will require from 750 to 1000 tons of fabricated material, instead of 300 tons as reported a week ago. Inquiries include:

Inland Steel Co., Indiana Harbor, Ind., 600 tons for extension to a coal mixing plant.

Belfont Iron Works, Ironton, Ohio, trestle and ore bins, 500 tons. Freyn, Brassert & Co., Chicago, engineers.

West End Power Station, Cincinnati, 500 tons. Sargent & Lundy, Chicago, engineers.

Chicago & Northwestern Railroad, repairs to bridge on southern Illinois Division, 200 tons.

Larowe Milling Co. building, Rossford, Ohio, 100 tons.

J. I. Case Co., building, St. Louis, 200 tons.

Recent awards include:

United Theatres Co., office building and alterations to theatre, Cincinnati, 271 tons, to Wendnagel & Co.

Robinson Co., theatre building, Peoria, Ill., 213 tons, to A. Lucas & Son, Peoria.

Blackstone Theater, South Bend, Ind., 193 tons, to Wendnagel & Co.

Southwestern Gas & Elec. Co., Texarkana, Ark., 150 tons, to Worden-Allen Co.

Larowe Milling Co., building, Rossford, Ohio, 200 tons to the Riverside Bridge Co., Martin's Ferry, Ohio.

Phelps Dodge Corporation, Bisbee, Ariz., 2200 tons to Wisconsin Bridge & Iron Works.

Pettibone Mulliken Co., foundry, Chicago, 400 tons to Morava Construction Co.

Famous Barr Building, St. Louis, 450 tons to Christopher & Simpson Iron Works.

Bar Harbor and Union River Power Co., power plant, Ellsworth, Me., 100 tons, to Lackawanna Bridge Co.

Manz Engraving Co., Chicago, 160 tons for an addition to Vander-Loot Iron Works.

The mill quotation is 2.45c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote \$3.47 for material out of warehouse.

Wire Products.—Wire companies are no longer seeking business, but are concentrating their efforts on producing and shipping business booked. Shipments have been obstructed of late, first on account of the shop men's strike and more recently because of a car shortage resulting from the heavy grain traffic in the West. The car situation, however, is gradually improving. The Interstate Iron & Steel Co. is increasing its drawing capacity and will soon be able to utilize its entire output of wire rods. For mill prices see finished iron and steel f.o.b. Pittsburgh, page 611.

Rails and Track Supplies.—The aggregate business in rails and track fastenings is fair, but individual orders are small. Mine operators are preparing estimates of their light rail requirements and will soon be in the market for round tonnages. We quote:

Standard railroad spikes, 3.35c., Pittsburgh. Track bolts with square nuts, 4.35c., Pittsburgh. Steel tie plates and iron angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 2.90c., f.o.b. makers' mills. Light rails, 2.45c., f.o.b. makers' mills, with usual extras.

Cast Iron Pipe.—Shop operation is impeded by a shortage of labor as well as agitation among those employed. The United States Cast Iron & Foundry Co. is low bidder on 1700 tons to be purchased by Chicago, and has been awarded 350 tons by Edgeley, N. D. Hamilton, Ohio, will close bids on 1800 tons Aug. 27. Spirit Lake, Iowa will take figures on 365 tons Aug. 29, and on the following day Lincoln, Neb. will consider bids on 37 tons of 12-in. pipe.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$53.80; 6-in. to 16-in., \$55.80; class A and gas pipe, \$2 extra.

Bolts and Nuts.—Bolt and nut manufacturers are well booked ahead, most of them for practically the remainder of the year. It is possible that before 1920 the demand will exceed their capacity, in which case consumers will have to draw on the warehouses, which fortunately are well stocked. For mill prices see finished iron and steel f.o.b. Pittsburgh, page 611. Jobbers quote:

Structural rivets, 4.72c.; boiler rivets, 4.82c.; machine bolts up to $\frac{3}{4}$ x 4 in., 50 and 5 per cent off; larger sizes, 40 and 5 off; carriage bolts up to $\frac{3}{4}$ x 6 in., 45 and 5 off; larger sizes, 30 and 10 off; hot pressed nuts, square tapped and hexagon tapped, \$1.85 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off. Quantity extras for nuts are canceled.

Old Material.—The market continues dull with little activity on the part of either dealers or consumers. Such trading as has taken place indicates that prices are upon about the same level as a week ago with a few of them somewhat lower. On August 22 the Government received bids on 15,000 tons of billets, the highest bids being in excess of \$3 a ton below those rejected several weeks ago, which ranged from \$24.67 to \$28.88 per gross ton. The only railroad offering is a small list issued by the Rock Island.

Per Gross Ton

We quote delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	\$25.00 to \$26.00
Relaying rails	35.00 to 45.00
Carwheels	26.00 to 27.00
Steel rails, reolling	27.00 to 28.00
Steel rails less than 3 ft.	23.50 to 24.00
Heavy melting steel	20.00 to 21.00
Frogs, switches and guards, cut apart	20.00 to 21.00
Shoveling steel	20.00 to 20.50

Per Net Ton

Iron angles and splice bars	\$24.00 to \$25.00
Steel angle bars	20.50 to 21.00
Iron arch bars and transoms	24.00 to 25.00
Iron car axles	29.00 to 30.00
Steel car axles	26.50 to 27.00
No. 1 bushelling	16.50 to 17.00
No. 2 bushelling	11.50 to 12.00
Cut forge	19.50 to 20.00
Pipes and flues	15.75 to 16.25
No. 1 railroad wrought	19.00 to 20.00
No. 2 railroad wrought	18.50 to 19.00
Steel knuckles and couplers	21.00 to 21.50
Coil springs	21.50 to 22.00
No. 1 cast	24.00 to 25.00
Boiler punchings	23.00 to 23.50
Locomotive tires, smooth	21.50 to 22.00
Machine shop turnings	10.00 to 10.50
Cast borings	12.25 to 13.25
Stove plate and light cast	21.50 to 23.50
Grate bars	21.00 to 21.50
Brake shoes	20.00 to 21.00
Railroad malleable	20.00 to 21.00
Agricultural malleable	19.50 to 20.50
Country mixed	16.00 to 17.00

American Property Sold by War Department to the French Government

WASHINGTON, Aug. 26.—The War Department has announced the completion of the sale of the property of the American Expeditionary Forces in France to the French Government. The latter is to pay \$400,000,000, for which the French Parliament must now arrange a special bond issue. The total cost of the property to our Government was about \$1,000,000,000, but much of this is represented by construction work which has no salvage value. Efforts are now under way to sell in France the surplus property in the United States originally intended for use overseas and which is not saleable here. This includes 197 locomotives, 12,000 box cars and 25,000 tons of steel rails. The locomotives and cars are not usable on American roads. Most of the rails are open-hearth, 80-lb. A. R. A. type B rail. One item is 900 tons of 35-lb. A. S. C. E.

After a fight with the police, 27 strikers from the Standard Steel Car Co., Butler, Pa., were arrested for assaulting non-union workmen who were on their way on an interurban car to the plant to work. A dozen of the arrested men were armed with revolvers.

Philadelphia

PHILADELPHIA, Aug. 26.

The labor situation is the dominating factor in the iron and steel market. Not only is the fear of a general strike of steel workers an ever-present consideration, but the shortage of labor is making itself felt in several directions. With demands for steel products showing a steady increase, it is evident that the restrictive element in production will now be mainly the insufficient supply of workers. Added to this is the demand of labor for a shorter workday. This demand has already culminated in a strike of open-hearth workers at the plant of the Alan Wood Iron & Steel Co. The 8-hr. day was granted in the open-hearth department, though the blast furnace department is operating on 12-hr. turns and the mills on 10-hr. turns. The effect of the 8-hr. day upon output of steel is already marked; so much so, in fact, that this company has virtually withdrawn from the market on semi-finished steel, plates and sheets, as it cannot much exceed a 50 per cent output without several hundred more men, which so far it has been unable to get. A western Pennsylvania wire mill, though heavily booked with orders, is operating at only 50 per cent of capacity, due to a shortage of wire drawers. Its employment department has scoured the country without success to find men skilled in this class of work. Other wire companies are said to be similarly situated. There are also fears that the coke supply this fall and winter will fall short of demands, due to labor shortage in the coke regions.

The possibility of a general steel strike as a result of the demands of the 24 unions whose representatives met at Youngstown, Ohio, last week, is recognized by steel companies, but it is believed that such a strike would be of short duration. It is not too much to say that some of the steel companies would welcome the proposed strike so that the issue of the open or closed shop in the steel industry may be settled. Advices from Washington are that officials of the American Federation of Labor, who are to meet there this week, may decide that the present is an "inopportune time" for a steel strike. Officials of steel companies who are closely in touch with the activities of the committee for organizing the iron and steel workers declare that the strength of the union movement has been very much exaggerated by these organizers.

A resolution adopted by committees representing the workers in the Johnstown, Coatesville and Nicetown plants of the Midvale Steel & Ordnance Co. shows that some of the steel workers, at least, are viewing present economic conditions in a different light. This resolution is published in full elsewhere in this issue of THE IRON AGE.

Demand for steel products shows a steady increase. In the past two weeks one company has booked 20,000 tons of plates for export, mostly to Japan; a Youngstown company has taken 10,000 tons of plates for delivery over the remainder of the year at the full price, 2.65c., Pittsburgh, and the demand for bars has been so insistent that an eastern company has raised its base price to 2.50c., Pittsburgh, and also increased hoops and bands to 3.20c., Pittsburgh. There have been good sales of light rails, particularly to mining companies in Pennsylvania and West Virginia at the March 21 schedule price of 2.45c. An Eastern company, however, has booked some business at \$49 per gross ton and a shade under that price.

Foundry pig iron is in demand for next year, but furnaces are not inclined to sell that far ahead. When quotations have been asked for, they have been given in a few instances, but they represent an advance of \$2 and \$3 a ton over present prices, and one furnace is quoting \$35 for No. 2 plain iron for first quarter.

Pig Iron.—A fair amount of business in foundry iron for delivery over the remainder of the year or in fourth quarter has been done in the past week, but furnaces have consistently refrained from taking any business for next year, though there are inquiries in the market aggregating several thousand tons. When quotations have been insisted upon by consumers for first quarter or first half, they have been given in a few instances, but the prices quoted are \$2 and \$3 a

ton higher than those now prevailing. A Western Pennsylvania furnace is quoting \$35 on No. 2 plain for first quarter. Two consumers who were in the market for fourth quarter and first quarter have bought only for fourth quarter. One of these, the J. L. Mott Iron Works, Trenton, N. J., inquired for about 4000 tons for both periods, but, so far as reported, bought about 2750 tons for fourth quarter. Another, the Richardson & Boynton Co., New York, bought about 2000 tons for the same delivery. The Sanitary Co. of America, Linfield, Pa., is in the market for 1500 to 1800 tons of foundry iron for first half. The Pennsylvania Railroad wants 1000 tons of carwheel iron and Stanley G. Flagg & Co., Pottstown, Pa., will probably buy 500 tons of malleable iron this week. There is no activity in basic. A recent sale of 3000 tons of basic to a plate manufacturer at \$25.70, furnace, was due to special conditions and probably could not be duplicated, the seller now quoting \$26, furnace. There is no demand for low phosphorus and the prices nominally quoted are \$38 for copper free and \$35 for copper bearing, f.o.b. furnace. Standish furnace, which has been making standard low phosphorus for some time past, will soon go out of blast. Prices for foundry iron continue without change. One of the most active sellers is quoting \$28.60 for No. 2 plain, \$29.60 for No. 2 X and \$30.60 for No. 1 foundry, all delivered Philadelphia. Other sellers are asking higher prices. Virginia furnaces are not willing to take orders that net less than \$30 or \$31 a ton at their furnace, and consequently their sales are mostly the high silicon grades. One furnace will take orders only for the next 60 days at \$28 for No. 2 plain, \$29 for No. 2 X and \$30 for No. 1 foundry, all f.o.b. furnace, to which must be added a freight rate of \$4.10 for delivery in Philadelphia or vicinity. The last recorded sale of malleable iron was at \$28.35, delivered, but that was several weeks ago. An Eastern Pennsylvania maker is now quoting \$29, furnace, while Buffalo makers ask \$27.25, furnace, with a \$3.90 freight rate. The fuel situation is giving concern to all furnacemen, not only on account of higher prices, but because of the fear that the labor shortage in the coke regions may result in a diminishing supply that will fall short of needs. The Midvale Steel & Ordnance Co. on Saturday blew in another furnace, making six of its eleven stacks active. Another will be blown in early next month. The Saxton furnace has blown in on foundry iron and the small Swede furnace of the Alan Wood Iron & Steel Co. will go in on foundry next week.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

Eastern Penna. No. 2 X, 2.25 to 2.75 sil.	.....	\$29.60 to \$31.10
Eastern Penna., No. 2 plain, 1.75 to 2.25 sil.	.....	28.60 to 30.16
Virginia No. 2 X, 2.25 to 2.75 sil.	.....	33.10
Virginia No. 2 plain, 1.75 to 2.25 sil.	.....	32.10
Basic	.....	26.60 to 27.10
Gray forge	.....	26.60
Malleable	.....	(nominal) 28.35
Standard low phosphorus (f.o.b. furnace)	.....	38.00
Copper bearing low phosphorus (f.o.b. furnace)	.....	35.00

Ferroalloys.—A better demand for ferromanganese is in evidence. The Youngstown Sheet & Tube Co. is in the market for 2000 tons of 80 per cent for last quarter and first quarter, and there are other smaller inquiries. Prices show no firmness, principally on account of the competition of the British alloy, which can be obtained at \$100, seaboard. Domestic producers are nominally quoting \$110, delivered, but their policy is to meet the British price on any desirable business. It is evident that the British makers are loath to surrender the American market to the new American ferromanganese industry, as they have always regarded it as peculiarly their own field, having had things pretty much their own way prior to the war. It is intimated that they are making very little profit and probably are sustaining a loss in selling at \$100, seaboard. Prices for coke are extremely high in Great Britain, and even with a low freight rate, said to be about \$5 a ton, it is difficult for American ferromanganese makers to see how they can come out even. It is supposed that the British Government made certain allowances on sup-

plies of manganese ore which were left over at the end of the war, and this may equalize to some extent their high production costs due to the cost of coke. The Midvale Steel & Ordnance Co. has bought 8000 tons of manganese ore at 58c. a unit, and this will be converted into ferromanganese by the Lavino Furnace Co., which has just put the Marietta furnace into blast, making two furnaces for this company now on ferromanganese, the other active stack being Oriskany. The Leesport Furnace Co., Leesport, Pa., after several unsuccessful attempts to make ferromanganese, has blown out its furnace and probably will make no further effort to operate it. Manganese ore is nominally quoted at 55c. to 60c. a unit, but a recent sale of a small tonnage was made at 53c. There is very little demand for spiegel-eisen and producers are not anxious to sell, as they say it is not profitable to make it at \$35, furnace, the present nominal asking price.

Coke.—Prices for coke continue to advance. Furnace coke is quoted at \$5 to \$5.50, Connellsville, and the probability is that the latter figure is more nearly the price at which any business could be done. Foundry coke is also higher, \$6 having easily been obtained by local sellers this week. The Rainey-Wood Coke Co. lighted this week a part of its by-product coke ovens, which are to be operated in conjunction with the Alan Wood Iron & Steel Co. The new plant consists of two batteries of 55 ovens each, and when in full operation will have a daily capacity of about 1300 tons of coke.

Semi-Finished Steel.—A local seller of billets and slabs is out of the market, requiring all of its steel for its own use. There is very little semi-finished steel for the open market. Sales of forging billets have been made at \$51 and \$54, base, Pittsburgh. The latter price is a \$3 advance over the schedule of March 21 last. We quote open-hearth rerolling billets at \$42.50; forging billets at \$55 and slabs at \$45, all delivered Philadelphia.

Plates.—A much better demand for plates is noted by some of the mills. One company has booked 20,000 tons within the past two weeks for export, most of this to go to Japan. With the tonnage it already had on its books this producer is virtually out of the market. A Youngstown mill has booked 10,000 tons in this district for delivery over the last five months of the year at the full price of 2.65c., Pittsburgh. Another maker reports that the orders which came in by mail on Monday represent an aggregate which considerably exceeds the business done in one day in some time. The Carnegie Steel Co. has issued a new card announcing the elimination of the extra of 10c. per 100 lb. for Lloyds' inspection. The Lukens Steel Co. has taken the same action, and it is expected that all other plate makers will follow suit. Prices of plates are somewhat firmer, though it is still possible to buy below 2.65c. Up to within a week or so ago considerable export business had been done on the basis of 2.75c., New York, but there is now said to be less of this, and on some fair-sized tonnages for export prices ranging from 2.60c. to 2.65c., Pittsburgh, have been obtained. In a few instances domestic quotations on plates at below 2.65c. have been withdrawn by the companies which made them. The bid of the Carnegie Steel Co. of 2.50c. on plates for the Navy Department has upset the market to some extent, as buyers evidently expect other makers to quote the same price on commercial transactions. The Pennsylvania Railroad is expected to buy another tonnage of plates for car repairs. We quote sheared plates, 1/4 in. and heavier, at 2.895c., base, Philadelphia.

Structural Material.—An apartment house requiring about 200 tons of fabricated steel is in the market. No large building jobs have been let. Some fabricators in this district are figuring on a bridge across the Danube River, requiring about 20,000 or 25,000 tons of steel, but there is little definite as to this project because financial arrangements have not been completed. Notwithstanding the bid of 2.40c., Pittsburgh, by the Carnegie Steel Co. on shapes for the Navy Department, the mills in this district are adhering firmly to 2.45c., Pittsburgh, or 2.695c., Philadelphia.

Sheets.—A local company which makes blue annealed sheets is virtually sold up for the remainder of the year. Such free tonnage as it may have will only be sufficient to take care of the normal demands of regular customers. Some of the mills in the Pittsburgh-Youngstown district, which have selling offices here, are also out of the market.

Bars.—An Eastern mill has advanced the base price of steel bars to 2.50c., an increase of \$3 a ton, and has taken some orders on this basis. The bar iron market is quiet, but prices continue firm on the basis of 2.50c. for common bar iron and 1c. per lb. higher for double refined iron. Some of the smaller makers of cold-finished steel bars have protested to their larger competitors against the revision of prices, effective Aug. 18, from a list and discount basis to a net price with extras. Their objections chiefly concern the reductions which were made on some sizes, squares and hexagons in particular having been subjected to deep cuts. The action of the makers of cold finished steel bars is said to have been due to the threat of certain large consumers, particularly the automobile trade, that they would put in their own cold-rolling and drawing equipment unless a revision of prices was made. One of the large automobile companies several weeks ago covered its requirements well into next year at a discount of 33 per cent, equivalent to \$5 a ton below the regular quotations then in effect. A delegation of Eastern jobbers visited Pittsburgh this week to confer with the three largest makers with reference to warehouse extras. We quote soft steel bars at 2.595c., cold finished steel bars at 3.845c., bar iron at 2.745c., double refined bar iron at 3.745c., all base Philadelphia.

Rails.—A local company put in bids of \$57 on standard open-hearth rails and \$55 on Bessemer rails on the 100,000 tons inquired for by the Railroad Administration. Other makers are understood to have bid \$10 a ton lower. Light rails are in good demand, several thousand tons having been sold within the past week by one mill to mining companies in Pennsylvania and West Virginia at 2.45c., the price adopted as of March 21. Another Eastern mill has booked considerable business at \$49 per gross ton and a shade under that price.

Bolts, Nuts and Rivets.—Eastern makers are now quoting the higher prices which were announced Aug. 15, these advances being the same as went into effect in the Central West about two weeks earlier. These prices and discounts are shown on page 611. Track bolts are quoted at 4.50c., Pittsburgh.

Spikes.—An advance on spikes has been put into effect by Eastern makers. Railroad spikes 1/2 in. and larger are now quoted at 3.50c. and small spikes, 7/16 and 3/4 in. dia., at 4.50c., Pittsburgh; boat spikes in small lots are 4.50c., and in lots of 25 kegs or more, 4c., Pittsburgh.

Wire Products.—A western Pennsylvania wire mill is operating at only 50 per cent capacity due to a shortage of wire drawers. The company's employment department has scoured the country for men skilled in this class of work but without success. Some other wire mills are said to be in a similar position. There is a good demand for wire products, but relatively little business is being taken.

Hoops and Bands.—An Eastern company has advanced its price on hoops and bands to 3.30c., Pittsburgh, an increase of \$3 a ton. Other makers continue on the basis of 3.05c.

Old Material.—Labor unrest continues to have a marked effect on the scrap market. There is practically no demand from consumers. Scrap dealers look for a good demand and higher prices as soon as the labor situation clears. The local ordnance office has rejected bids recently on about 10,000 tons of sheet steel on the ground that the bids were too low. The most recent bid rejected was \$20.92, f.o.b. Easton, Pa., for 3,000 tons of shell forgings. There continues to be a fairly good demand for rerolling rails. Cumberland, Md., is offering \$26 and a Pennsylvania re-roller of-

fers \$25, delivered. We quote for delivery at consumers' works eastern Pennsylvania as follows:

No. 1 heavy melting steel.....	\$19.00 to \$20.00
Steel rails, rerolling	25.00 to 26.00
No. 1 low phosphorus, heavy, 0.04 and under	25.00 to 26.00
Carwheels	24.50 to 26.00
No. 1 railroad wrought.....	26.50 to 27.50
No. 1 yard wrought.....	23.00 to 24.00
No. 1 forge fire	14.00 to 15.00
Bundled skeleton	14.00 to 15.00
No. 1 busheling	16.00 to 17.00
No. 2 busheling	13.00 to 14.00
Turnings (short shoveling grade for blast furnace use)	14.50 to 15.00
Mixed borings and turnings (for blast furnace use)	13.00 to 14.00
Machine-shop turnings (for rolling mill and steel works use).....	15.00 to 15.50
Heavy axle turnings (or equivalent) ..	16.50 to 17.00
Cast borings (clean)	15.00 to 16.00
No. 1 cast	25.00 to 26.00
Railroad grate bars	20.00 to 21.00
Stove plate	20.50 to 21.50
Railroad malleable	20.00 to 21.00
Wrought iron and soft steel pipes and tubes (new specifications)	19.50 to 20.50
Ungraded pipe	15.00 to 16.00

Buffalo

BUFFALO, Aug. 25.

Pig Iron.—Although sales and inquiries are lighter in volume than for the past two weeks, the tone of the market is exceedingly strong and prices are very firmly held. In fact, furnaces are now quoting the top notch of recent schedules and affording no opportunity for price concessions, no matter how attractive the tonnage offered may be. Another Buffalo maker has retired from the market for this year's delivery and no very large fourth quarter tonnages remain untaken. No furnaces in this district are selling iron at less than \$27.50, furnace, for gray forge; \$28 for No. 2 plain; \$29 for No. 2-X and malleable and \$30 for No. 1 foundry, 2.75 to 3.75 silicon; and one interest is asking 50c. per ton more on some of these grades for such tonnages as it has to sell for fourth quarter. Tonnages sold for 1920 delivery are very small, because of the possibilities of labor difficulties and an increase in production costs. Most furnaces are refraining from quoting for 1920 for the present. The outstanding feature of the week is the extra heavy demand for shipments on contracts, which is not only taking the entire production of furnaces, but is cutting in heavily on stocks in yards. If this rate continues, it will mean that these stocks will be entirely depleted before many weeks have passed. We quote as follows, f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon.....	\$30.00
No. 2 X, 2.25 to 2.75 silicon.....	29.50
No. 2 plain foundry, 1.75 to 2.25 silicon ..	28.00 to 28.50
Gray forge	27.50 to 28.00
Malleable, silicon not over 2.25.....	29.00
Basic	26.75
Basic, 1 to 1½ per cent manganese.....	27.25
Basic, 1½ to 2½ per cent manganese.....	27.75
Bessemer	30.00
Lake Superior charcoal, regular grades, f.o.b. Buffalo	34.85

Finished Iron and Steel.—Specifications are coming in freely against open contracts, but mills are more conservative in the acceptance of new obligations in view of threatened labor troubles. The cost uncertainties and the possibilities of increases are too great and the margin of profit too small to permit of commitments being made very far ahead. Canadian business is moving in a fairly good volume, in most lines, with a moderate amount of structural specifications coming in. The Beaver Boards Companies, Inc., Buffalo, is taking bids on 200 tons of structural steel for enlarging and remodeling a plant at North Tonawanda, N. Y., which it has purchased from the Tonawanda Board & Paper Co. The Buffalo Structural Steel Co. has received the contract for 100 tons of steel for the T. & E. Dickinson building, Buffalo, and the Lackawanna Bridge Co., Buffalo, has the contract for fabricating and erecting 265 tons for a moving picture theater building at Johnston City, N. Y.

Prices f.o.b. Buffalo are as follows: Steel bars, 3.40½c.; iron bars, 4.10½c.; shapes, 3.50½c.; plates, 3.70½c.; No. 10 blue annealed sheets, 4.60½c.; No. 28 black, 5.65½c.; No. 28

galvanized sheets, 7.00½c. For "store door delivery" add 0.04½c. to each commodity.

Old Material.—Market conditions are somewhat duller than a week ago, although prices on all commodities are firm. The element of uncertainty brought about by possibility of strike troubles causes hesitancy on the part of mills to take on much tonnage of scrap materials, and dealers are not inclined to endeavor to force business and are willing to hold off, believing that better prices are likely to be obtained by this course. Dealers report that orders which were coming in freely from outside points last week have tapered off, as consumers are now more reluctant to lay in stock. Dealers' asking prices are the same as a week ago and we quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel, regular grades.....	\$18.00 to \$18.50
Low phosphorus, 0.04 and under.....	22.00 to 23.00
No. 1 railroad wrought	23.00 to 23.50
No. 1 machinery casts.....	24.50 to 25.50
Iron axles	26.00 to 27.00
Steel axles	26.00 to 27.00
Carwheels	22.50 to 23.50
Railroad malleable	19.00 to 20.00
Machine-shop turnings	10.00 to 12.00
Heavy axle turnings	15.00 to 16.00
Clean cast borings	13.00 to 14.00
Iron rails	23.00 to 24.00
Locomotive grate bars.....	19.00 to 20.00
Stove plate	21.00 to 22.00
Wrought pipe	16.00 to 17.00
No. 1 busheling	15.00 to 16.00
Bundled sheet stamping.....	13.00 to 14.00

Birmingham

BIRMINGHAM, ALA., Aug. 25.

Pig Iron.—The close of the third week in August found the minimum price in the Birmingham iron producing market \$27.75, compared with \$27.50 the week previous. The only interest on the \$27.50 basis advanced on Aug. 20 to \$28. Another on the \$27.75 basis did likewise about the same time. Two others were still on the \$27.75 basis with an eye to near price advances. The inquiry is strong for 1920, but denial is made of any business booked for that period. The largest foundry interest is understood to have a lot of unsold 1918 capacity yet to dispose of. Another has two months' capacity open. A third is short of everything but very low grades, and very high silicon for the remainder of the year. Furnaces soon to come in will, of course, add to unsold capacity. The Sloss-Sheffield company is blowing in a fourth stack this week and the Shelby company also goes in on charcoal after a long shutdown. The Sheffield Iron Corporation resumed Aug. 4 and Woodstock at Anniston is arranging for resumption. With the Sloss-Sheffield and Shelby stacks in operation active capacity shows an increase of 75 per cent over the low mark, 25 active stacks, compared with 15. Including these two, the active list follows: Tennessee company, 9; Woodward, 4; Sloss-Sheffield, 4; Republic, 2; Alabama, 2; Gulf States Steel, Jenifer, Sheffield and Shelby Iron, 1 each; total 25. Eight are on basic, one on special iron, one on charcoal and the remainder on foundry. One interest has booked an order for 1000 tons for export at \$28. Two interests secured each 1000 tons of the American Radiator allotment ordered at the Chicago office. Car shortage is not as bad as it was, but iron shipments have been greatly impeded and stocks on yards will show a considerable increase at the end of the month. Added impetus at practically all steel works is reported. The tendency toward maximum operations is quite general. We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25.....	\$27.75 to \$28.00
Basic	26.75 to 27.00

Coal and Coke.—Coal production is still low, but will increase in response to the increasing demand for furnace coke. Foundry coke makers are also putting in additional ovens as they secure labor. The ruling price for good foundry to regular customers is \$9; to some others, \$9.50.

Cast Iron Pipe.—Water and gas pipe works are beginning to take on capacity operations similar to sanitary shops, which have all they can do. Two of these

companies are at capacity and the leading interest is taking on additional capacity in response to brisk receipt of orders. A feature of the trade has been taking of orders by one interest which has every reason to believe that they were first turned down by rivals on account of booked-up capacity.

Old Material.—Scrap dealers have finally scored. Prices have taken a jump of \$2 to \$3 upward. This is probably due to the reduction of stocks in large local consumers' yards, the increasing output and the need of supplies. The movement has picked up since the announcement of the new schedule. We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

Old steel rails	\$17.00 to \$18.00
No. 1 heavy steel	16.00 to 17.00
Cast iron borings	10.00 to 10.50
Machine shop turnings	10.00 to 10.50
Stove plate	20.00 to 21.00
No. 1 cast	23.00 to 24.00
Car wheels	23.00 to \$24.00
Tramcar wheels	22.50 to 23.00
Steel axles	25.00 to 26.00
No. 1 wrought	16.00 to 18.00

St. Louis

ST. LOUIS, Aug. 25.

Pig Iron.—Foundries continue to buy freely of pig iron in lots ranging downward from 500 tons, this applying to gray iron and malleable establishments and to the stovemakers, but the heavy users of basic are still largely out of the market. All the foundries seem to have plenty of business, and they are inquiring for first quarter and first half iron, but have so far been unable to induce the furnace representatives to quote any prices or enter into any contracts. Although the labor situation shows some indications of instability, there have been no open breaks here except in the Belleville district, where demands have been made and some men are out. The prices show some signs of further advances and one interest has already notified its representative that higher prices must be asked. The market generally, however, has not been in receipt of such instructions.

Coke.—Coke business has been unimportant, as users are largely covered by contracts to Jan. 1, and are not making any effort to care for needs beyond that period, knowing that efforts would meet with little success. Local by-product output is being absorbed steadily on contracts still existing.

Finished Iron and Steel.—There has been a continuance of the growing demand for finished products, but large contracts for future delivery are not being made, due to the present uncertainty as to future prices. Buying for immediate and early forward delivery is free and the mill representatives are getting about all the business that can be cared for without extending deliveries. Warehouses are operating at a good pace on immediate delivery material. For stock out of warehouse we quote as follows:

Soft steel bars, 3.44c; iron bars, 3.44c; structural material, 3.54c; tank plates, 3.74c; No. 8 sheets, 4.49c; No. 10 blue annealed sheets, 4.64c; No. 28 black sheets, 5.69c; No. 35 galvanized sheets, black sheet gage, 7.04c.

Old Material.—The scrap dealers seem to be recovering their courage since the recent slump, but there is not yet sufficient revivification to set the prices marching upward. In consequence the figures quoted are largely nominal, as there are no real transactions to back them up. Dealers seem for the most part willing to hold their material in their yards, believing that there will be advances soon, and that they will be justified in paying the carrying charges. They are also inclined to take in any bargains that are offered by the weaker-kneed section of the trade. The strength of pig iron is encouraging them also, although consumers still hold to the view that pig iron is still cheaper than scrap, and are governing themselves accordingly. There are few railroad lists coming out at this period of the month and the Government sales are being minimized because of the state of the market.

We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$20.50 to \$21.00
Old steel rails, rerolling	26.00 to 26.50
Old steel rails, less than 3 ft.	21.00 to 21.50
Relaying rails, standard sections, subject to inspection	38.00 to 40.00
Old carwheels	22.00 to 22.50
No. 1 railroad heavy melting steel	18.00 to 18.50
Heavy shoveling steel	16.00 to 16.50
Ordinary shoveling steel	15.00 to 15.50
Frogs, switches and guards, cut apart	18.00 to 18.50
Ordinary bundled sheets	9.00 to 9.50
Heavy axle and tire turnings	11.50 to 12.00

Per Net Ton	
Iron axle bars	\$18.50 to \$19.00
Steel angle bars	16.00 to 16.50
Iron car axles	30.50 to 31.00
Steel car axles	26.50 to 27.00
Wrought arch bars and transoms	21.50 to 22.00
No. 1 railroad wrought	17.00 to 17.50
No. 2 railroad wrought	16.00 to 16.50
Railroad springs	16.50 to 17.00
Steel couplers and knuckles	15.50 to 16.00
Locomotive tires, 42 in. and over, smooth inside	18.50 to 19.00
No. 1 dealers' forge	15.00 to 15.50
Cast iron borings	8.50 to 9.00
No. 1 busheling	14.50 to 15.00
No. 1 boiler, cut to sheets and rings	13.50 to 14.00
No. 1 railroad cast	22.00 to 22.50
Stove plate and light cast	18.00 to 18.50
Railroad malleable	14.50 to 15.00
Agricultural malleable	14.50 to 15.00
Pipes and flues	14.50 to 15.00
Heavy railroad sheet and tank	13.50 to 14.00
Railroad grate bars	16.00 to 16.50
Machine shop turnings	9.00 to 9.50
Country mixed	12.00 to 12.50
Uncut railroad mixed	14.00 to 14.50
Horseshoes	18.50 to 19.00

New York

NEW YORK, Aug. 26.

Pig Iron.—Activity during the past few days has centered around buying for delivery during the first half of 1920. Most furnaces are very conservative in their policy as to sales for that delivery, but a considerable number of transactions have taken place at an advance of from \$1 to \$2 above the quotations for the remainder of this year. For delivery prior to Jan. 1, quotations are firmer and \$29 seems to be the minimum in eastern Pennsylvania, equivalent to \$30.80, tidewater. The Alleghany Ore & Iron Co. announces that on account of heavy sales from stock during the past week and an accident to its blowing engine at Iron Gate, Va., it has withdrawn all quotations and will probably be out of the market for the remainder of this year. It will, however, receive inquiries for the fourth quarter and for next year, although it cannot figure costs and tonnage for the latter delivery. A number of sales of moderate tonnages have been closed for shipment to Sweden and Japan and inquiries from other foreign countries are pending. We quote tidewater delivery for the remainder of this year as follows:

No. 1 foundry, silicon, 2.75 to 3.25	\$30.80 to \$32.80
No. 2 X, silicon, 2.25 to 2.75	30.80 to 31.80
No. 2 plain, silicon, 1.75 to 2.25	29.80 to 30.80
No. 2 X, Virginia, silicon, 2.25 to 2.75	32.40 to 35.40

Ferroalloys.—Outside of an inquiry for 2000 tons of standard ferromanganese from a Central Western steel company for delivery in the last quarter or the first half, the market is quiet. Most British producers are quoting \$105, seaboard, although one or two are willing to sell at \$100, seaboard. At just what figure the American producers would be willing to do business is uncertain, the last quotation having been \$115, delivered; but it is evident that to secure any desirable business offered they will have to meet the British quotations. British producers are making a strong bid for the American market and the possibility is acknowledged that they may be able to resume their pre-war status when they furnished 50 per cent of the ferromanganese consumed by the American steel industry. Already the American production has fallen to a pre-war monthly basis, having been only slightly over 10,750 tons in the month of July. Of interest is the report that

a proposal for a duty of 75c. per unit, or \$60 per ton of 80 per cent ferromanganese is before the Ways and Means Committee of the House of Representatives. The spiegeleisen market is quiet but strong at \$35, furnace, the only sales reported being small lots for early delivery. Production is the lowest in years, having averaged less than 6000 tons per month in the first half of the year against an output of 10,500 tons per month in 1913 and 20,750 tons per month in 1918. An interesting foreign inquiry is for 3000 tons of 10 to 12 per cent alloy, formerly available in Austria, but as this is not produced in this country it may be possible to interest the consumer in the standard American product. An interesting development is that in the last two or three months at least 5000 tons has been sold for export. Supplies of manganese ore continue large, the imports in June having been 31,550 tons, making the average for the first half of this year 37,664 tons per month. In this connection it is understood that a large Eastern steel company recently bought a substantial amount of Brazilian ore at 58c. per unit and then contracted with a furnace company to convert this into ferromanganese. Ferrosilicon, 50 per cent, is quiet and strong, with quotations varying from \$90 to \$100 per ton, delivered, depending upon the sale, the quantity desired and the delivery.

Finished Iron and Steel.—As a part of its program to put its rolling stock in better shape, the Pennsylvania Railroad is in the market for 5000 hoppers, which are to be attached to old car trucks. Car builders are figuring on this business and the orders will probably be let soon. Each hopper will take about 10 tons of plates, shapes and bars, a total of 50,000 tons. The Chesapeake & Ohio Railroad is asking for bids on repairing of 2000 cars and the Western Maryland Railroad, which operates in the Connellsville coke regions, wants 700 cars repaired. The Union Tank Line Co. is in the market for 1000 tank cars. The Pressed Steel Car Co. has received an order for 500 gondola cars from the South African Government. The Mexican Petroleum Co. has placed an order for 600 tank cars. There are other inquiries for cars for export, several of these being for sugar cane cars for Cuba, but there is nothing definite as to when the orders may be placed. Railroad rolling stock is admittedly in bad shape and car builders expect that considerable repair business will be placed within the next few months, from which betterment in the plate market may be expected. Steel for the new Hotel Linnard, New York, about 4000 tons, will be fabricated by the McClintic-Marshall Co., the general contractor being the Thompson & Starrett Co. Otherwise the structural steel market the past week has been rather quiet. Prices on all steel products, with the exception of plates, on which some concessions are still being made, are firm. There is a good demand for sheets, bars and wire products. The reduced prices on cold finished steel bars are expected to result in the placing of more business by manufacturing consumers.

We quote as follows for mill shipments: Bar iron, refined grade, 2.77c.; double refined bar iron, 3.77c.; soft steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c.; all New York.

Warehouse Business.—A \$20 warehousing differential has failed of being established, due to the unwillingness of several large interests to go above a \$15 level. August business averages slightly better than that of July. The trade in sheets and bars is particularly strong, but very little is placed for future delivery. Following the new Pittsburgh schedule on cold-drawn steel, local business in this line has reached a basis of 5c. per lb. for rounds and 5½c. per lb. for flats, squares and hexagons, plus all the mill extras, with quantity differentials. The revised schedule amounts to a substantial reduction on some sizes and shapes. We quote out-of-store prices as follows: No. 10 blue annealed sheets, 4.57c.; No. 28 box annealed black sheets, 5.50c.; No. 28 galvanized sheets, 6.75c. to 7.00c.; steel bars, 3.37c.; structural shapes, 3.47c.; plates, 3.67c.; bands, 3/16-in. Nos. 10 and 12, 4.07c.; cold-drawn steel, rounds 5c. and flats, squares and hexagons, 5½c., base.

Cast-Iron Pipe.—The recent advance of \$2 per ton is being maintained and there is considerable demand from private sources, but little municipal business is pending. The Central Foundry Co., Vincennes, Ind., after an idleness of a number of years, will resume operations at its shop. We quote 6-in. and heavier, \$54.30; 4-in., \$57.30, with \$2 additional for class A and gas pipe.

Old Material.—Heavy melting steel has been hardest hit in the recent slump in the scrap market, the quantities changing hands being negligible. Sales could be made were dealers willing to part with it at slightly lower than market figures, but this most are unwilling to do, feeling secure in the expected future advance in prices. As an instance, a broker this week offered a dealer \$16 a gross ton for this grade, New York, but the dealer refused. There is a fair demand for cast, but this is rather scarce, particularly No. 1 machinery cast, which has advanced. The American Brake Shoe & Foundry Co. has been buying considerable stove plate delivered to its New Jersey plant for \$20.50. Borings and turnings for blast furnace use are still active with a tendency toward higher prices. No. 1 railroad wrought is also being sold in moderate amounts. In spite of the temporary stagnation of the market, a decided tone of optimism prevails. A sale of 95,000 lb. of mixed scrap, with high grade stock included, was made recently by the New York ordnance office to the Borough Metal Co., Brooklyn, at \$37 a ton. Prices which dealers and brokers are paying, New York, per gross ton, follow:

Old steel rails (or equivalent).....	\$15.50 to \$16.00
Heavy melting steel.....	14.50 to 15.50
Rerolling rails.....	21.00 to 22.00
Relaying rails, nominal.....	41.00 to 42.00
Steel car axles.....	26.00 to 27.00
Iron car axles.....	32.00 to 33.00
No. 1 railroad wrought.....	23.00 to 23.50
Wrought iron track.....	18.00 to 19.00
Forge fire.....	10.50 to 11.00
No. 1 yard wrought, long.....	18.50 to 19.00
Light iron.....	6.00 to 7.00
Cast borings (clean).....	11.00 to 11.50
Machine shop turnings.....	11.00 to 11.50
Mixed borings and turnings.....	9.50 to 10.00
Iron and steel pipe (1 in. min. diam., not under 2 ft. long).....	16.00 to 16.50
Stove plate.....	17.50 to 18.00
Locomotive grate bars.....	17.50 to 18.00
Malleable cast (railroad).....	16.00 to 17.00
Old car wheels.....	21.50 to 22.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast.....	\$25.00 to \$26.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	23.00 to 23.50
No. 1 heavy cast, not cupola size.....	16.00 to 16.50
No. 2 cast (radiators, cast boilers, etc.).....	17.50 to 18.00

Boston

BOSTON, Aug. 25.

Pig Iron.—The chief query is in regard to when furnaces will start taking 1920 business on a large scale. Only a few sales have been made thus far and these are not admitted openly by the sellers. The cost situation of furnaces has not improved, nor are there indications that it will. In fact, there are frequent predictions that iron will be selling next year considerably higher than at present. Sales took a slump last week though one company reports business twice as good as the week before. However, as much business has been taken as can be handled at the furnaces and most iron in the yards is already sold. A Southern furnace last week raised its quotations \$1, which, with the \$8 freight rate, will make it more difficult to sell in this territory. Virginia furnaces are practically out of the market, leaving the Pennsylvania and Buffalo furnaces principally to get what business there is. That the textile manufacturers are busy is indicated by the sales of scrap and machine tools, as well as pig iron to the textile machinery makers. It is reported that a cotton mill manufacturer of Massachusetts recently inquired for 8000 tons of foundry iron, half of which he has bought already. Two hundred

tons were sold to another Massachusetts textile machinery maker. A sale of 500 tons of Virginia iron, silicon 1.75 to 2.25, was reported on good authority at \$30, furnace. Another sale of foundry iron in New England was around 750 tons. We quote, delivered to New England points:

Structural Steel.—Sales in this material are small compared to those of other products such as bars. Architects and builders have been figuring on many building jobs only to have them rejected and the projects abandoned for the present because of high costs. New awards include: The Bethlehem Construction Co., 110 tons of structural steel for the Washington Avenue Bridge at New Haven, Conn., and 130 tons for the Lawrence Hall Building at New London, Conn.; to the American Bridge Co., 125 tons for a weave mill at Waterbury, Mass.; to the Eastern Bridge & Structural Co., 135 tons for a theater in Springfield, Mass. The New England Structural Co. has been awarded the fabricating contract of 100 tons for a weave shed at Clinton, Mass., for the Roubaix Mills Co.

Old Material.—Interest of dealers is focused upon the many sales of Government scrap through the Boston ordnance office, since buying by dealers is much more active than that of consumers. Bidders show wide variation in their price figures submitted, some doubtless regarding the material of semi-finished quality, others considering it merely scrap. The lack of sales of heavy melting steel is especially conspicuous. Borings and turnings for eastern Pennsylvania blast furnaces are in fair demand, while some clean cast iron borings are being sold to chemical plants, steam being passed over them to make hydrogen. Cast scrap is still in good demand, particularly from makers of textile machinery. A foundry making certain railroad equipment is reported to be buying up all available stove plate for \$22, delivered. Strikes in steel plants are regarded by the local scrap trade as the reason for the slump in the grades of material they use. In spite of inactivity, prices are being maintained on the strength of expected future sales. With pig iron more costly and difficult to obtain, scrap dealers predict advancing prices for their commodities. Dealers' buying prices Boston follow:

No. 1 heavy melting steel.....	\$15.50 to \$16.50
No. 1 railroad wrought.....	19.00 to 19.50
No. 1 yard wrought.....	17.00 to 17.50
Wrought pipe (1 in. in diameter, over 2 ft. long).....	15.50 to 16.00
Machine shop turnings.....	11.00 to 11.50
Cast iron borings.....	11.00 to 11.50
Heavy axle turnings.....	11.00 to 11.50
Blast furnace borings and turnings..	10.00 to 10.50
Forge scrap.....	10.50 to 11.00
Bundled skeleton.....	10.50 to 11.00
Steel car axles.....	21.00 to 21.50
Curwheels.....	24.50 to 25.00
Machinery cast.....	25.00 to 26.00
No. 2 cast.....	22.00 to 23.00
Stove plate.....	19.50 to 20.00
Railroad malleable.....	17.50 to 18.00

Cleveland

CLEVELAND, Aug. 26.

With the ending of the dock strike at the head of the Lakes, ore is beginning to move more freely, but it will be a week or more before shipments are going forward at full swing. The suspension of shipments is expected to have little effect on the season's movements, as boats will be operated a little longer in the fall, making up for lost time.

The Newburgh plant of the American Steel & Wire Co. is back to about 70 per cent production, following the suspension due to the strike of the company's railroad employees, but the four Central blast furnaces are still idle because of a strike of the furnace employees, and the company is bringing in some pig iron from its other furnaces.

Iron Ore.—The dock strike at the head of the Lakes was ended Monday with the return of the ore handlers at the Great Northern dock at Superior. At the same time work was resumed at Escanaba. The dock employees at Marquette and Ashland returned to work Saturday, the shutdown at the latter port having lasted over three weeks. The plans of some of the boat man-

agers have been changed as a result of calling off the strike and some of the boats that had been ordered tied up will be sent up the Lakes. The barges of the Pittsburgh Steamship Co., that were to have been laid up will be sent back for cargoes as rapidly as possible. It is not expected that the loading of ore will be well under way before next week, as some of the dock men will be slow in getting back to work. It is estimated that the strike will cut August shipments over one-half of what they would otherwise have been, and that the movement for the month will not exceed 4,000,000 tons. There is little activity in the ore market, but some small lot sales are still being made. No large lot sales are expected during the remainder of the season. Ore prices delivered f.o.b., lower Lake ports, are as follows:

Old range Bessemer, \$6.45; old range non-Bessemer, \$5.70; Mesaba Bessemer, \$6.20; Mesaba non-Bessemer, \$5.55.

Pig Iron.—The pig iron market is very firm and the demand for foundry iron continues fairly active. There is a little inquiry for malleable iron, and no activity in steel-making grades. Lake furnaces report a good volume of orders for foundry iron in lots ranging from 200 to 1,500 tons for the last half delivery. Considerable of this business is coming from foundries that had previously bought iron for the last half, but not enough to cover their requirements. However, it is understood that a few consumers, believing prices will go higher next year, are buying in excess of their last-half requirements, and will store the surplus iron in the yards for use next year. Inquiry for foundry iron for next year is fairly plentiful, but Lake furnaces generally are refusing to quote for that delivery although one producer, while not seeking orders, is taking a little first-half tonnage. Furnace stocks are being reduced considerably, and there is not a great deal of iron for sale in their territory for this year's delivery. Local furnaces are quoting foundry iron at \$27.25 at furnace as a minimum for 1.75 to 2.25 silicon iron, and one producer has made a few sales at a 25c. advance over this price. However, one Lake producer has not made an advance over prices that have prevailed for some months. Several lots of Cleveland foundry iron were sold during the week to Michigan and Indiana melters who usually secure their supply from nearer sources. These sales were made at the regular Cleveland price, and the freight rate is around \$3.40. Owing to the scarcity of silvery iron due to the shutting down of southern Ohio furnaces, some foundries are using off-grades of Bessemer ferrosilicon as a substitute. Southern silvery iron in limited quantities is to be had. Southern iron is generally quoted at \$27.75 for 1.75 to 2.25 silicon. We quote delivered Cleveland, as follows:

Bessemer.....	\$29.35
Basic.....	25.65
Northern No. 2 foundry, silicon, 1.75 to 2.25..	27.65
Southern foundry, silicon 2.25 to 2.75.....	33.75
Gray forge.....	26.15
Ohio silvery, silicon, 8 per cent.....	44.65
Standard low phos., Valley furnace.....	\$38.00 to 40.00

Coke.—The foundry coke market has stiffened and \$6 per ton appears to be the lowest price that is being quoted for standard Connellsville coke for the remainder of the year and for the first half. However, some producers are not quoting for delivery beyond this year. Considerable activity has developed in the market during the past few days. Foundries are taking large shipments in order to stock up for the winter.

Finished Iron and Steel.—Specifications on contracts, particularly for steel bars and structural material, are heavy. Demand for sheets, largely from the automobile trade, continues very active. The sheet market is firm, and a Cleveland mill is now quoting Nos. 12 to 8 gage sheets only on the blue-annealed basis, having withdrawn its plate base price. The demand for hoops is heavy and one leading producer is now taking orders only from its regular trade. Fabricators report a heavy demand for steel for small building work, but no large awards were made during the week.

The Citizens and Union Commercial Bank building to be started next spring will require 18,000 tons of structural material. New bids will be taken Sept. 2 for the county jail building in Cleveland, requiring 2000

tons. Inquiries include one for 200 tons for a plant for the Lang Body Co., Cleveland. The King Bridge Co. has taken a viaduct in Willoughby requiring 300 tons of reinforcing bars. The demand for hard steel bars for building work is so heavy that some of the mills are several weeks behind on deliveries. Under the new cold rolled shafting card making a 3.60c. per lb. base price instead of a discount price from list, the base price is not changed, but there is slight reduction in smaller and larger sizes and a reduction of \$10 to \$20 per ton on shafting in hexagon, squares and flats. The stock price on shafting is 4.75c., base, or about the same as the old price. Mills report a heavy volume of business in gear blanks and other specialties. Warehouse prices are as follows:

Steel bars, 3.27c.; plates, 3.57c.; structural shapes, 3.37c.; bands and hoops, 3.97c.; No. 10 blue annealed sheets, 4.47c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

Alloy Steel.—The alloy steel market is firm, and deliveries on bars in 1/4 to 1-in. sizes have become so slow that some consumers are placing orders for shipment from stock at warehouse prices. Some business has been taken in standard alloy steels for early 1920 delivery at 15 to 20 per cent advance over present prices. The demand for carbon tool steel has improved, but high speed steel is moving slowly.

Bolts, Nuts and Rivets.—Bolt, nut and rivet manufacturers at a meeting in Pittsburgh Aug. 20 adopted a resolution in favor of retaining Pittsburgh as the basing point for their products. The demand for bolts and nuts continues fairly heavy. Manufacturers are urging consumers to send in specifications early for future requirements in view of a possible suspension of operations by steel mills, should a strike be called, which would cut off the supply of raw material for the bolt and nut manufacturers. Orders are being booked at the recent advance in price, and it is stated that the market has become firmer although the old prices have not entirely disappeared. Rivet manufacturers are getting a heavy volume of specifications on contracts, but new orders are rather light.

Old Material.—The market is very dull and weak. Prices have further declined on heavy melting steel, for which mills will not pay \$20, and quotations have been marked down on several other grades. The weakness is attributed almost wholly to the possibility of labor troubles in the steel plants. Consumers are awaiting developments, and are buying very little material, and only such scrap as are needed for early requirements. Trading between dealers has also fallen off considerably. Turnings sold late in the week at around \$12, but are a drag on the market and have further declined. Some dealers have commenced to sell their yard stocks of heavy melting steel scrap in limited tonnages. The American Steel & Wire Co., which cut off scrap shipments to its Newburgh mills during its recent shutdown, started to take scrap again this week. We quote per gross ton delivered consumers' yards in Cleveland and vicinity, as follows:

Heavy melting steel	\$19.75 to \$20.00
Steel rails, under 3 ft.	22.75 to 23.00
Steel rails, rerolling	25.50 to 26.50
Iron rails	26.00 to 27.00
Iron car axles	35.00 to 36.00
Steel car axles	33.00 to 34.00
Low phosphorus melting scrap	21.75 to 22.00
Cast borings	14.25 to 14.75
Iron and steel turnings and drillings	10.75 to 11.25
Compressed steel	17.75 to 18.00
No. 1 railroad wrought	23.00 to 23.50
Cast iron carwheels	22.00 to 22.50
Agricultural malleable	17.50 to 18.00
Railroad malleable	20.75 to 21.25
Steel axle turnings	16.25 to 16.75
Light bundled sheet scrap	15.50 to 16.00
No. 1 cast	23.00 to 24.00
No. 1 busheling	19.50 to 20.00
Drop forge flashings, 10 in. and under	18.25 to 18.75
Drop forge flashings, over 10 in.	15.50 to 16.00
Railroad grate bars	19.00 to 20.00
Stove plate	19.00 to 20.00

The Carnegie Steel Co. is installing a sintering plant of the Dwight & Lloyd type at its Farrell, Pa., works, with a daily capacity of 300 tons. There will be one Dwight & Lloyd double-length sintering machine.

Cincinnati

CINCINNATI, Aug. 26.

Pig Iron.—The scarcity of high silicon iron has become acute. All Jackson County furnaces are now closed down, however. Bessie furnace at New Straitsville, Ohio, is reported to have blown in on silvery iron. This will not tend to relieve the situation at all, as it is understood the iron to be produced is already sold. Many inquiries for foundry iron for first quarter and first half shipment are coming in in anticipation of higher freight rates, which would increase production costs. Furnaces both in the North and South refuse to make even nominal quotations for the delivery named. Considerable foundry iron has been sold in this territory for last quarter shipment, the consumers evidently intending to use the metal for their first quarter requirements. A large part of this iron will come from the South. The minimum quotation on Southern foundry iron is now \$27.50 Birmingham basis, and only two or three interests will accept business at this figure. Others are quoting from 25 to 50 cents higher. Northern furnaces are holding firm at \$27.50 to \$27.75, Iron-ton, but have little iron to offer for this year's shipment. A malleable melter located south of the Ohio River is asking for 2500 tons of malleable iron, part of which is for first half shipment. An Ohio melter also wants 500 tons for last quarter delivery. No interest in basic is taken by any of the nearby melters. It is reported that a large radiator manufacturer has purchased a round tonnage of foundry iron to be distributed among its different plants, none of which is located in this vicinity. Chicago furnaces are understood to have booked most of this business, agreeing to extend some shipments through the first quarter. The car shortage shows very little, if any, improvement.

Based on freight rates of \$3.60 from Birmingham and \$1.80 from Iron-ton, we quote f.o.b. Cincinnati:

Southern coke, silicon, 1.75 to 2.25 (base price)	\$31.10
Southern coke, silicon, 2.25 to 2.75 (No. 2 soft)	32.10
Ohio silvery, 8 per cent silicon	42.05
Southern Ohio coke, silicon, 1.75 to 2.25 (No. 2)	28.55
Basic Northern	26.55
Standard Southern carwheel	51.60
Malleable	29.05
Lake Superior charcoal	35.35

Coke.—Producers in all districts are having a hard time obtaining cars in which to make shipments, although the situation in the Connellsville field is now as bad as in other districts. Some Connellsville furnace coke for spot shipment has sold as high as \$4.50 per net ton at oven, but the average quotation is around \$4.25. Foundry grades range from \$5.75 to \$6.25. There is not much contracting for future shipment, but a comparatively heavy demand for foundry coke for spot shipment is in evidence. Some small lots of furnace coke are also wanted for filling in purposes. Wise County and Pocahontas prices on 72-hr. coke are unchanged around \$7 to \$7.50 and the average New River quotation is \$8 per net ton at oven.

Fluorspar.—Specifications on contracts are coming in at a satisfactory rate, but there is little new business reported. The car shortage is causing some trouble, but as a rule shipments have been moving better than was anticipated when the car supply trouble first developed. Washed gravel fluorspar is unchanged at \$25 per ton at point of shipment.

Finished Material.—The new jobbers' prices on cold rolled shafting has now been fixed at 5c. per lb. base with the usual extras as per list. The mill base price is 3.60c. per lb., Pittsburgh. Business is reported to be fairly good. Wire nails have been advanced from \$3.75 to \$4 per keg base. A number of hardware merchants were able to place their orders last week before the advance took place, and for this reason the demand is rather slack at the present time. Galvanized sheets are getting somewhat scarce and mill shipments in many cases are behind the schedule. The mill price of No. 28 black sheets is 4.35c. and galvanized 5.70c., Pittsburgh, with a freight rate to Cincinnati of 23c. Not much railroad track material is being bought, al-

though occasional orders for spikes and track bolts are turned in.

The following are present local jobbers' prices: Steel and iron bars, 3.33c. base; bands, 4.03c. base; structural shapes, 3.42c. base; plates, 1/4-in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c.; wire nails, \$4.00 per ktg. base; machine bolts, smaller sizes, 50 and 5 per cent off list; larger sizes, 40 and 5 per cent. Semi-finished nuts, 9/16-in. and smaller, 75 and 10 per cent off list; soft steel rivets, 60 per cent off; wood screws, 80 and 10 per cent off, and coach screws, 50 and 10 per cent off list. Cold-rolled shafting, 5c. per lb. base.

High Speed Steel.—Leading standard brands are unchanged at \$1.50 per lb., but this figure has been shaded by some of the smaller producers. Business in general shows some improvement and automobile manufacturers are especially good customers at the present time.

Old Material.—The market is weak, but no definite changes in quotations can be made. Business is dull and shipments on former contracts are moving slowly because of the scarcity of cars. The Andrews Steel Co.'s plant is still closed, thus shutting off the demand for scrap from that source. Railroad offerings are very light. The following are dealers' buying prices f.o.b. at yards, in carload lots, Southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet	\$12.00 to \$12.50
Old iron rails	22.50 to 23.00
Relaying rails, 50 lb. and up.....	40.00 to 41.00
Re-rolling steel rails	21.00 to 21.50
Heavy melting steel	17.00 to 17.50
Steel rails for melting.....	17.00 to 17.50
Old carwheels	18.50 to 19.00
No. 1 railroad wrought.....	18.00 to 18.50
Per Net Ton	
Cast borings	\$8.00 to \$8.50
Steel turnings	7.00 to 7.25
Railroad cast	20.00 to 20.50
No. 1 machinery.....	22.00 to 22.50
Burnt scrap	13.00 to 14.00
Iron axles	24.50 to 25.00
Locomotive tires (smooth inside)....	18.00 to 18.50
Pipes and flues	13.50 to 14.00
Malleable cast	16.00 to 16.50
Railroad tank and sheet.....	12.00 to 12.50

EXPORT TRADE

Current Business At a Good Rate—Japan the Most Active Buyer—England Buys Billets

American steel is being sold for shipment abroad apparently at the rate of about 7,000,000 tons a year. The official figures of the Department of Commerce showed a total of more than 544,000 tons for June, and August business is believed to be at a better rate; in fact with some sellers this has been the best month of the year. The large business that is being done is all the more remarkable in view of the fact that it is coming mostly in lots of from 50 to 1000 tons.

Japan is the most active buyer, but there is a good volume of business from South America and even Mexico has appeared as a fairly good buyer. Owing to the continued unfavorable exchange situation, the European markets are not opening up, it being virtually impossible to do much business with Great Britain or continental countries. The largest order from Great Britain reported in some time was 20,000 tons of re-rolling billets, which has been taken by the United States Steel Products Co. to be rolled at a mill in the Chicago district. There are other inquiries for semi-finished steel from England which are in prospect of being closed.

Plates have been in demand for Japan, an eastern Pennsylvania mill having booked 20,000 tons, mostly for that country, in the past two weeks, and a 5000-ton inquiry is being figured on by Chicago mills. Japan has been buying steel products of almost all descriptions, including some railroad equipment.

The South African Government has closed for railroad equipment, including 500 gondola cars, which are to be manufactured by a Pittsburgh car company. There are other inquiries in the market for cars for export, including several for sugar-cane cars for Cuba.

Other inquiries include 10,000 reels of barbed wire

for Brazil and 5000 tons of plates for a shipyard in the British West Indies, while 100,000 boxes of tin plate for Japan are being figured on by one exporter. The Colonial Department of the Netherlands Government will place orders Sept. 3 for 1500 tons of galvanized sheets of various gages for shipment to the Dutch East Indies, and it is also in the market for galvanized telegraph wire.

Efforts have been made to sell American tin plate to Sweden, but most of the orders have gone to Great Britain.

British Prices Tending Higher

Steel Plates Scarce—Galvanized Sheets in Heavy Demand—Some Blast Furnaces Banked

(By Cab'e)

LONDON, ENGLAND, Aug. 25.

The Cleveland pig-iron market is quiet, with some Midland furnaces still banked for want of fuel. Hematite iron continues in strong demand, East Coast selling at £10.

Prices for finished steel tend higher, with ship plates quoted at £20 10s., boiler plates at £22 10s. Galvanized sheets are quoted at £29, with leading mills refusing to take further orders for this year. Tin plates are active at 39s. 9d., basis. Prompt plates are very scarce. Buyers desire early shipment, and inquiry is active, including some from Germany. An advance is expected in steel bars.

Cammell, Laird & Co. are acquiring the Midland Railway Carriage Wagon Co., with capital to be increased to £4,000,000.

Further sales of Lorraine pig iron are being made here by the French authorities. American steel billets are quoted at £12 13s. c.i.f.

The extension of the Stahlwerks Verband has been conditional on the agreement of works not represented at the meeting, but the Rheinische Stahlwerks not having withdrawn its resignation, the Verband is now considered dissolved unless fresh steps are taken.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalents figured at \$4.21 for £1, with the reservation that most makers have temporarily withdrawn prices:

Pig Iron:	£	s.	d.	£	s.	d.
East coast hematite..10	0	0	.....	42.10	.....	.....
West coast hematite..10	4	6	.....	45.02	.....	.....
Scottish foundry	10	3	0	42.73	.....	.....
Billets	15	0	0	63.15	.....	.....
Tin plate and sheet bars..14	0	0	.....	58.94	.....	.....
Rails, 60 lb. and upward	16	10	0	69.46	.....	.....
Bars, 3/4 to 3 in.....	20	5	0	.....	Cents per lb.	.....
Beams	17	10	0	.....	3.84	.....
Plates	18	5	0	.....	3.28	.....
Plates, ship	20	10	0	.....	3.43	.....
Plates, boiler	22	10	0	.....	3.85	.....
Bar iron, stand. crown..22	0	0	.....	4.22	.....	.....
Galvanized sheets	29	0	0	.....	4.13	.....
Tin plates, 14 x 20 coke. 1	19	9	.....	5.45	.....	.....
112 sheets, 108 lb., f.o.b. Wales.				8.37	.....	.....

Representatives Sent Abroad

While different in the export problems to be encountered, both the Scandinavian and North Sea countries and Russia, the Baltic and the Balkans are markets for American steel products of vast extent for peace time development as indicated by our pre-war trade and by post-war activities and inquiries. To further secure the establishment of large and aggressive agencies and become thoroughly conversant with the exact industrial credit and trade conditions existing, American exporters are sending many representatives across. Within the past week the American Steel Export Co. of New York has sent to these territories two men well qualified to judge the situation and to develop immediate business. These are K. Orbanowski, vice president and general manager of the East European Trading Co., Inc., who will visit Poland, Czecho-Slovakia, Serbia, Rumania, Bulgaria, South East Russia, Caucasus, Germany, Sweden and Finland and, as previously stated in THE IRON AGE, F. H. Tackaberry, who will visit England, Belgium, Norway, Denmark, Holland and Sweden.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin, New York	Lead		Spelter	
	Lake	Electro- lytic		New York	St. Louis	New York	St. Louis
Aug.	24.00	23.50	57.00	5.90	5.75	8.00	7.65
20.	24.00	23.50	57.00	5.90	5.75	8.00	7.65
21.	24.00	23.50	57.00	5.90	5.75	8.00	7.65
22.	24.00	23.50	57.00	5.90	5.75	8.00	7.65
23.	24.00	23.50	57.00	5.90	5.75	8.00	7.65
25.	24.00	23.50	56.00	5.90	5.75	7.97 1/2	7.62 1/2
26.	24.00	23.50	56.00	5.90	5.75	7.95	7.60

NEW YORK, Aug. 19.

The markets are generally quiet and prices in most cases steady. Demand for copper has slackened, but producers' quotations continue firm. The tin market has been moderately active, but spot metal is slightly lower. The outside lead market is gradually approaching that of the leading interest, but demand is not heavy. The zinc market is inactive with prices nominally easier. Antimony is unchanged.

New York

Copper.—While small amounts of electrolytic copper are obtainable from dealers and second hands at prices considerably under those quoted by producers in general, the latter continue firm in their quotations of 23.50c. to 24c., New York, for August-September delivery. For last quarter some producers quote 24c., but continue unwilling to sell beyond October unless necessary. Small quantities of electrolytic copper have sold in the last week as low as 22.25c. New York, for September delivery, but it is believed that the amount obtainable at these levels is limited and that most of the cheaper lots have been absorbed. Lake copper is quoted at 24c. New York, for September or early delivery. Demand in general has slackened, due to various labor uncertainties, and inquiries from abroad have not resulted in business, due largely to the more unfavorable exchange rates.

Tin.—Early last week an active business was done in future delivery from the Straits, but since then that market has been quiet and very little business has been reported. The arrivals of tin continue large. For the month up to Aug. 25 these have amounted to 4055 tons, of which 2805 tons has been received at Atlantic ports. The quantity afloat is also large, amounting to 4090 tons to date. The closing prices yesterday for future shipment were as follows: September shipment from the Straits, 52.50c., with October shipment at 52.25c.; Lamb & Flagg, prompt shipment from England, 52.25c., and Straits tin, prompt shipment from England, 53c. to 53.25c. Spot Straits tin, New York, is slightly lower at 56c., due largely to the heavy arrivals. What business has been done has been at cut prices, due to the various interpretations put upon the effect of exchange rates, some figuring them lower than others.

Lead.—In the past week this market has been very quiet with the outside price gradually approaching that of the American Smelting & Refining Co., which we quote at 6c., New York, or 5.75c., St. Louis. In the last two weeks the upward movement of the outside market has been rapid, but lately the pace has slackened. Demand is not large, but the tone is strong. The market is quoted at 5.90c., New York, or 5.75c., St. Louis, with some sellers reporting as high as 6c., New York, done on a fairly large business.

Zinc (Spelter).—This market could hardly be more inactive than in the last week. Prime Western for August-September delivery is nominally quoted at 7.60c., St. Louis, or 7.95c., New York, at which levels a small amount of business has been done. Producers

in general, however, are unwilling to recognize these prices and are not pressing the market. Because of the possibility of a strike in the steel trade, galvanizing plants are buying as little zinc as possible and for some time brass makers have not been actively interested. Production continues to slacken and, because of the fact that natural gas producers are considering the doubling of their price for gas for the second time, some zinc producers are not eager to sell.

Antimony.—The market is unchanged and quiet at 9.25c. to 9.37 1/2c., New York, duty paid, for wholesale lots for early delivery.

Aluminum.—Quotations are unchanged for virgin metal. 98 to 99 per cent pure, at 32c. to 33c., New York, for wholesale lots for early delivery.

Old Metals.—The market is not so strong. Prices are as follows:

	Cents per lb.
Copper, heavy and crucible.....	22.00
Copper, heavy and wire	20.00
Copper, light and bottoms.....	18.00
Brass, heavy	14.50
Brass, light	11.00
Heavy machine composition	20.00
No. 1 yellow rod brass turnings.....	12.75
No. 1 red brass or composition turnings.....	16.00
Lead, heavy	5.70
Lead, tea	4.25
Zinc	6.00

Chicago

CHICAGO, Aug. 26.—Small lots of copper are changing hands, but the volume of business is not large. Considerable tin is being sold both for future and immediate delivery. Spot tin is now available at from 60c. to 63c., with two weeks' delivery at from 55c. to 58c., and November or December delivery at from 52c. to 53c. There is a normal degree of activity in lead, but spelter has declined, although a considerable amount has been sold. Antimony continues dull. Scrap-metal prices remain unchanged. We quote copper at 23c. to 23.50c. for carloads; tin, 60c. to 63c.; lead, 5.65c. to 5.70c.; spelter, 7.65c.; antimony, 10c. to 11c. On old metals we quote copper wire, crucible shapes, 17c.; copper clips, 16c.; copper bottoms, 15c.; red brass, 17c.; yellow brass, 11c.; lead pipe, 4.25c.; zinc, 5c.; pewter, No. 1, 30c.; tinfoil, 35c.; and block tin, 40c.; all these being buying prices for less than carload lots.

St. Louis

Aug. 25.—The metals have been quiet the past week, carload lots of lead closing at 5.60c.; spelter, 7.55c. In less than carloads quotations are: Lead, 6c.; spelter, 8.25c.; tin, 70c., nominal; copper, 23.50c.; antimony, 11.50c. In the Joplin district ore prices have improved, top grades of zinc blende, basis 60 per cent, going at \$48.50 per ton, with seconds at \$47.50. The demand was better and larger tonnages were bought by the smelters. Lead ore was steady at \$62.50, basis 80 per cent, with a few choice lots going at \$65. Calamine was firm at \$25 to \$30 per ton, basis 40 per cent. Average prices for the week for the district were: Lead ore, \$62; zinc blende, \$47, and calamine, \$30. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 7.50c.; heavy yellow brass, 10c.; heavy red brass and heavy copper and copper wire, 15c.; light copper, 13c.; pewter, 35c.; tinfoil, 43c.; lead, 4c.; zinc, 4c.; tea lead, 3c.; aluminum, 18c.

The Driver-Harris Co., Harrison, N. J., is now selling its wire-rope products direct to the trade instead of through its former selling agents. These products include sash cord and tiller rope in plain iron, galvanized iron, phosphor bronze, special bronze, monel metal, and all special grades. In addition to this, the company has increased its facilities. Other products of the company are resistance materials of nickel alloys in the form of wire, strip and sheet, for electric heating controllers, rheostats and resistance elements.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

The prices below, except on nuts, bolts, rivets and spikes, are based on those announced at Washington by the Industrial Board on March 20, 1919, effective the following day, which since that date have largely governed market transactions, though there have been variations, as indicated in market reports on other pages.

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.315, minimum carload 40,000 lb.; and \$1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c.; minimum carload 46,000 lb.; Denver, 99c.; minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs:

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and Zees, structural sizes, 2.45c.

Wire Products

Wire nails, \$3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.50, and shorter than 1 in., \$2.00. Bright basic wire \$3.15 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.00; galvanized wire, \$3.70; galvanized barbed wire and fence staples, \$4.10; painted barbed wire, \$3.40; polished fence staples, \$3.40; cement-coated nails, \$2.85 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ per cent off list for carload lots, 59½ per cent for 1000-rod lots, and 58½ per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....\$3.90 base
Large boiler rivets.....\$4.00
¼ in., 5/16 in. and 7/16 in. diameter.....60-5 per cent off list
Machine bolts, hp. nuts, ¾ in. x 4 in.:
Smaller and shorter, rolled threads.....60 per cent off list
Cut threads.....50-10 per cent off list
Larger and longer sizes.....45-5 per cent off list
Machine bolts, c.p.c. and t. nuts, ¾ in. x 4 in.:
Smaller and shorter.....40-10-5 per cent off list
Larger and longer.....40 per cent off list
Carriage bolts, ¾ in. x 6 in.:
Smaller and shorter, rolled threads.....50-10 per cent off list
Cut threads.....50 per cent off list
Larger and longer sizes.....40-5 per cent off list
Lag bolts.....60 per cent off list
Plow bolts, Nos. 1, 2 and 3.....50-5 per cent off list
Plow bolts, Nos. 4 to 10.....50-5 plus 20 per cent off list
Hot pressed nuts, sq. blank.....3.10c. per lb. off list
Hot pressed nuts, hex. blank.....3.10c. per lb. off list
Hot pressed nuts, sq. tapped.....2.85c. per lb. off list
Hot pressed nuts, hex. tapped.....2.85c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....3.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped.....2.85c. per lb. off list
Semi-finished hex. nuts:
¾ in. and larger.....70 per cent off list
9/16 in. and smaller.....75-10 per cent off list
Stove bolts in packages.....75-10 per cent off list
Stove bolts in bulk.....75-10-2½ per cent off list
Tire bolts.....60-10 per cent off list

The above discounts are from Aug. 4, 1919.

All prices carry standard extras, Pittsburgh basis.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$52; chain rods, \$60; screw, rivet and bolt rods and other rods of that character, \$60. Prices on high carbon rods are irregular. They range from \$65 to \$75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes ½ in., 9/16 and larger, \$3.35 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes ¾ in., 7/16 in. and smaller, \$3.85 to \$4 per 100 lb. in lots of 200 kegs of 200 lb. each or more; track bolts, \$4.35 to \$4.50 per 100 lb. in carload lots of 200 kegs or more, with the usual extras for small lots. Boat and barge spikes, \$3.85 to \$4 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh.

Terne Plates

Prices of terne plate are as follows: 8-lb. coating, 200 lb., \$13.80 per package; 8-lb. coating, I. C., \$14.10; 12-lb. coating, I. C., \$15.80; 15-lb. coating, I. C., \$16.80; 20-lb. coating, I. C., \$18.05; 25-lb. coating, I. C., \$19.30; 30-lb. coating, I. C., \$20.30; 35-lb. coating, I. C., \$21.30; 40-lb. coating, I. C., \$22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. from mill. Prices on bar iron are 2.75c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Steel				Iron			
Inches		Black	Galv.	Inches		Black	Galv.
1/8	1/4 and 3/8	50½	24	1/8	1/4	29½	2½
1/2	.....	54½	40	3/8	.....	30½	3½
3/4	to 3	57½	44	1/2	.....	34½	16½
				3/4	to 1½	30	23½
Lap Weld				Lap Weld			
2	.....	50½	38	1½	.....	24½	9½
2½	to 6	53½	41	1½	.....	31½	17½
7	to 12	50½	37	2	.....	32½	18½
13	and 14	41	..	2½	to 6	34½	21½
15	.....	38½	..	7	to 12	31½	18½
Butt Weld, extra strong, plain ends				Butt Weld, extra strong, plain ends			
1/8	1/4 and 3/8	46½	29	1/8	1/4 and 3/8	28½	11½
1/2	.....	51½	39	1/2	.....	33½	20½
3/4	to 1½	55½	43	3/4	to 1½	39½	24½
2	to 3	56½	44				
Lap Weld, extra strong, plain ends				Lap Weld, extra strong, plain ends			
2	.....	48½	37	1½	.....	25½	10½
2½	to 4	51½	40	1½	.....	31½	17½
4½	to 6	50½	39	2	.....	33½	20½
7	to 8	46½	33	2½	to 4	35½	23½
9	to 12	41½	28	4½	to 6	34½	22½
				7	to 8	26½	14½
				9	to 12	21½	9½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel		Charcoal Iron	
3½ to 4½ in.....	40½	3½ to 4½ in.....	-16
2½ to 3½ in.....	30½	3 to 3½ in.....	-1½
2½ in.....	24	2½ to 2½ in.....	+1
1¾ to 2 in.....	19½	2 to 2½ in.....	+10
		1¾ to 1¾ in.....	+20

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	\$327	1½ in.	\$207
1¼ in.	267	2 to 2½ in.	177
1½ in.	257	2½ to 3 in.	167
1¾ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer		Cents per lb.
No. 8 and heavier.....		3.50
Nos. 9 and 10 (base).....		3.55
Nos. 11 and 12.....		3.60
Nos. 13 and 14.....		3.65
Nos. 15 and 16.....		3.75

Boz Annealed, Ore Pass Cold Rolled—Bessemer

Nos. 17 to 21.....	4.15
Nos. 22 to 24.....	4.20
Nos. 25 and 26.....	4.25
No. 27.....	4.30
No. 28 (base).....	4.35
No. 29.....	4.45
No. 30.....	4.55

Galvanized, Black Sheet Gage—Bessemer

Nos. 10 and 11.....	4.70
Nos. 12 and 14.....	4.80
Nos. 15 and 16.....	4.95
Nos. 17 to 21.....	5.10
Nos. 22 to 24.....	5.25
Nos. 25 and 26.....	5.40
No. 27.....	5.55
No. 28 (base).....	5.70
No. 29.....	5.95
No. 30.....	6.20

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16.....	4.15
Nos. 17 to 21.....	4.20
Nos. 22 to 24.....	4.25
Nos. 25 to 27.....	4.30
No. 28 (base).....	4.35
No. 29.....	4.40
No. 30.....	4.40
Nos. 30½ and 31.....	4.45

PERSONAL

C. le Maistre, secretary of the British Engineering Standards Association, is now in the United States to confer with the American Engineering Standards Committee, the officers of the American Society for Testing Materials and others interested in specifications covering materials of construction. Previously a visit was made to this country by an official representative of the Engineering Standards Committee of Holland, and in the past year conferences have been held in London and Paris relative to the standardization work in engineering materials which is being conducted in an organized way in various countries. Mr. le Maistre is secretary also of the International Aircraft Standards Commission, of which a meeting was held in London last year and one in Paris this year. Six of the Allied countries are represented by this commission, whose work looks to interchangeability of air machine parts and the establishment of standards for quality of aircraft materials.

Leonard B. Miller, member of the firm of Oglebay, Norton & Co., Cleveland, has resumed his duties after a very serious illness extending over two years. Mr. Miller is a high authority on mining matters, especially mine leases, and will, as in past years, give special attention to the mining operations of the firm in the Lake Superior region.

Stanley H. McKee has been appointed chief engineer of the Republic Iron & Steel Co., succeeding J. C. Shackelford, who has been named consulting engineer. The new chief engineer has been with the Republic company 15 years, going to the Youngstown, Ohio, offices when Republic executive departments were removed there. R. H. Crevoisie has been named assistant chief engineer, succeeding Mr. McKee.

Alvin R. Whitehead, formerly purchasing agent for the American Condenser & Engineering Corporation, Plattsburg, N. Y., has been appointed sales manager at the recently opened Newark office of the San Machinery Co., New York.

W. C. Epstein has been appointed general superintendent of the Duff Mfg. Co. works at Pittsburgh. Until recently he was in charge of the production engineering division of the Bureau of Aircraft Production at New York. Before entering the Government service he was with the American Brake Shoe & Foundry Co., Chicago, assisting the vice-president in charge of operation. Mr. Epstein is a graduate of the University of Wisconsin, class of 1913.

Hamilton Stewart, Pittsburgh, has been elected a director of the Crucible Steel Co. of America to fill the vacancy caused by the death of T. H. Given.

H. H. Hills, assistant general manager the Packard Motor Co., has been promoted to vice-president in charge of distribution. He was general sales manager for several years, joining the company in 1908. George R. Bury has been made general distribution manager. A year ago he was sent to Chicago to head the Packard Motor Co. of Chicago, before that being carriage sales manager for the company.

J. G. Hoffman has resigned as secretary of the Michigan Manufacturers' Association, effective Sept. 1, after about five years of service. He will be succeeded by L. J. Lovett, Chicago, an assistant of the Illinois Manufacturers' Association, who will have the title of general manager of the Michigan Association.

H. F. Harris has been appointed general manager of the Bethlehem Motors Corporation at Allentown, Pa. He is an industrial engineer with experience in the Everett, Studebaker, Maxwell and Overland organizations. His last position was general sales manager of the Republic Truck Co.

O. H. Taylor has been appointed New York representative of the Merrill-Stevens Shipbuilding Corporation, Jacksonville, Fla., and is permanently located at Room 308, Stuart Building, 280 Broadway, New York. C. W. Hendley has succeeded H. W. Hebb, resigned as

purchasing agent of the Jacksonville plant of the corporation. W. W. Helvenston has been appointed acting purchasing agent of their South Jacksonville plant. Messrs. Hendley and Helvenston were previously associated with the company as assistant purchasing agent.

Frederick C. Gilbert, vice-president and director of the Timken-Detroit Axle Co., in charge of sales and publicity, who has been connected with that organization since its formation 10 years ago, has resigned. Prior to his connection with the Timken company, Mr. Gilbert was for 14 years with the Pope Mfg. Co. as general production manager of several of their plants, including the Pope Motor Car Co., Toledo, afterward sold to the Willys-Overland interests, and the Columbia Steel Co., Elyria, Ohio. Mr. Gilbert plans to take a much-needed rest before making any announcement of his plans.

S. R. Willock, who has been assistant supply manager of the United States Shipping Board, Emergency Fleet Corporation, has resigned to become sales manager of the Woodard Machine Co., Wooster, Ohio.

Charles E. Gradwell, Gradwell & Pheils, Birmingham, England, sailed for home on Aug. 23. Messrs. Gradwell & Pheils are the agents for the Hofmann-Sproul Co., Philadelphia. Mr. Gradwell will leave for China as soon as he places certain contracts in England, and in China has been appointed special buyer for scrap for the Hofmann-Sproul Co. E. R. Doud, formerly with the Tioga Steel & Iron Co., and the Bethlehem Steel Co.; E. R. Campbell, formerly with the American Steel Foundries, and Walter MacCallum, chemical engineer, graduate of the Lehigh University, have joined the Hofmann-Sproul Co., handling scrap and new materials.

George N. Peek, formerly vice-chairman War Industries Board, and chairman of the Industrial Board of the Department of Commerce, has been elected president and general manager of the Moline Plow Co., Moline, Ill., to fill the vacancy created by the retirement of Frank Gates Allen. Mr. Peek was formerly vice-president of Deere & Co., Moline.

James M. Buick, former vice-president and general manager American Car & Foundry Co., has assumed the direction of the sales division of the company, the office of general manager having been abolished recently. He will be known as vice-president in charge of sales. The production division will be directed by William C. Dickerman, who will be designated as vice-president in charge of operations. He will be assisted by Frederick A. Stevenson, known as assistant vice-president in charge of operations, who will be head of the manufacturing section, and have charge of production in the car plants, rolling mills and foundries. There will also come under Mr. Dickerman's supervision the engineering, improvement and research, patent and industrial relations sections. The headquarters of both divisions will be at the general offices of the company, 165 Broadway, New York. Both Mr. Dickerman and Mr. Stevenson have been connected with the car company since its incorporation in 1899, advancing from apprenticeships in the shops to their present positions of responsibility. Mr. Dickerman as head of the war division, and Mr. Stevenson as his assistant, directed the company's recent program in the manufacture of munitions. Mr. Dickerman was graduated from Lehigh University in 1896 with the degree of mechanical engineer. He entered the employ of the Milton Car Works, Milton, Pa., in 1897, and at the formation of American Car & Foundry Co. was made assistant district manager for the Milton district. In 1900 he became sales agent of the company and in 1905 was elected to the vice-presidency. Mr. Stevenson entered the employ of the American Car & Foundry Co. in 1899 as an apprentice in the machine shop at the Detroit plant. In 1902 he was transferred to the Berwick plant with designation of master mechanic. In 1907 he returned to Detroit to assume a similar position in the company's plant. In 1909 he entered the assistant general manager's department at Chicago and remained until October, 1910, when he became assistant general superintendent of the Detroit plant. In 1912 Mr. Steven-

son was made general superintendent at Detroit and held this position until January, 1916, when he was appointed assistant general manager.

Charles W. McKay has taken charge of the appraisal division of L. V. Estes, Inc., industrial engineer, Chicago. This division specializes in the appraisal of industrial properties for Federal income tax purposes and in the appraisal of public utility properties in connection with rate cases. Mr. McKay is the author of books and articles for technical and trade journals on the general subject of valuation.

Edward R. Cardinal has been appointed district sales manager of the Tacony Steel Co., Tacony, Philadelphia. Mr. Cardinal has been district sales manager for the Carpenter Steel Co., and until recently president of the Cardinal Tool Co., Philadelphia.

Baylor Hickman, president Ewald Iron Co., Louisville, Ky., has been appointed exclusive agent for the Woodward Iron Co., Woodward, Ala., in the Louisville and St. Paul districts.

A. R. Williard has been appointed assistant manager of sales of the Cleveland office of the Carnegie Steel Co. He was formerly with the company's Detroit district office and with its alloy steel department in Pittsburgh and has been connected with the Cleveland office since he left the Government service in March, having been in the ordnance department with the rank of captain.

Charles A. Lynch, of Philadelphia, formerly chief operator in charge of inspection and manufacture of gun carriage components in the carriage division of the Pittsburgh district ordnance office, has become associated with the Fort Pitt Steel Casting Co., McKeesport, Pa., in the sales department.

William H. Bruce, who has been with the Mark Mfg. Co., Chicago, in the capacities of sales manager at Seattle, Wash., and sales manager at Minneapolis, Minn., has recently been appointed southern sales manager for the Steel & Tube Co. of America and Mark Mfg. Co., with offices at New Orleans.

S. H. Hedges, for some years assistant purchasing agent of the Republic Iron & Steel Co., Youngstown, Ohio, has been made purchasing agent to succeed Charles I. Starrett, who resigned recently.

H. P. Barnard has been appointed works manager of the Pittsburgh Crucible Steel Co. at Midland, Pa., the appointment having been made by J. W. Dougherty, president. R. A. McDonald, who was filling the position temporarily, has returned to his duties as general manager of the Crescent works of the Crucible Steel Co. of America, Braeburn, Pa.

Jerome R. George, vice-president Morgan Construction Co., Worcester, Mass., has returned from Europe, where he has passed the eight months studying the situation as it affects the business of his company. Mr. George landed in New York, Saturday, and resumed his duties at his office Tuesday. While abroad he passed considerable time in France, Great Britain and Belgium, visiting the steel centers and observing conditions in their relation to the probable requirements of the mills as to American equipment, particularly Morgan mills, a number of which are already in operation in various countries of Europe.

John F. Duffy will join the John Eichleay Jr. Co. in its iron and steel scrap department, with offices in the Oliver Building, Pittsburgh, on Sept. 1. Mr. Duffy, who is now with Walter-Wallingford & Co. in Pittsburgh, was a trade paper representative in the Pittsburgh district for several years, before making his present connection.

E. R. Doud, who for the past two years has been general superintendent of the Tioga Steel & Iron Co., has resigned. He was previously vice-president and general sales manager of the Alloy Steel Forging Co., Carnegie, Pa., and has now opened offices in the Miners Bank Building, Wilkes-Barre, Pa., as direct manufacturers representative, handling a complete line of iron, steel and metal products.

August H. Tuechter, president Cincinnati Bickford

Tool Co., Cincinnati, celebrated his fiftieth birthday Aug. 23 by giving an outing to employees of the company and their families at Highland Grove, Ohio.

T. J. Atkinson, formerly manager of sales of the Reilly Peabody Fuel Co., Frick Building, Pittsburgh, but who recently resigned, has been appointed manager of the coke department of the Superba Coal & Coke Co., Frick Building, Pittsburgh, effective from Monday, Aug. 25. Mr. Atkinson is very well and favorably known in coal and coke circles all over the country.

D. R. Salisbury, who has had charge of export sales in New York for the Allied Machinery Co. of America, will sail on the Baltic on Aug. 30 for London, England, where he will remain indefinitely as London representative of the company.

W. D. Truesdale, general auditor, was elected treasurer of the Inland Steel Co., Chicago, at an adjourned quarterly meeting of the board of directors, to succeed P. D. Block, recently elected president. J. H. Morris has been appointed general auditor to succeed Mr. Truesdale. Mr. Morris was formerly auditor of the old William Tod Co., Youngstown, and was in the auditing department of the Brier Hill Steel Co. when he resigned to go to the Inland company. Mr. Truesdale gained his first business experience in Youngstown with the First National Bank and subsequently served the Republic Iron & Steel Co., National Steel Co. and the Tennessee Coal & Iron Co.

OBITUARY

ALVAH STONE CHISHOLM, assistant to President W. P. Palmer of the American Steel & Wire Co., Cleveland, was stricken with heart disease while playing



A. S. CHISHOLM

tennis on the court of the East End Tennis Club, Cleveland, Aug. 20, and died soon after being taken to a hospital. Mr. Chisholm came of a family which has long been identified with the iron business in Cleveland. His grandfather, Henry Chisholm, was the founder of the Cleveland Rolling Mill Co. in 1856. In later years his father, William Chisholm, was president of the company. Mr. Chisholm was born Nov. 13, 1871, and graduated from Yale University in 1893. After making a tour of the world he entered the employ of the Cleveland Rolling Mill Co., in 1894, and, starting in the mills, learned the operating

part of the business in detail before beginning his career in office work. When the company was taken over by the American Steel & Wire Co., in 1899, Mr. Chisholm became assistant to the president, Mr. Palmer, and held that position until his death. His activities were not, however, limited to the steel industry. He took a leading part in banking, shipping and commercial enterprises, and was very active in philanthropic work. During the war he captained teams in the war chest, Red Cross and Liberty Loan drives. Mr. Chisholm was a man of action rather than of words, and established what President Palmer describes as a "wonderful record of efficiency."

THEODORE COOPER, for many years a consulting engineer in New York, died in that city, Aug. 24, at the age of 81. He was graduated from the Rensselaer Polytechnic Institute, Troy, N. Y., in 1858, and was an engineering officer in the Navy in the Civil War. He became superintendent of both the Delaware and Keystone Bridge companies, was assistant engineer in charge of construction of the first elevated railroads in New York.

GOVERNMENT SCRAP

Bids on Old and Semi-Finished Material—Invitations for Proposals

The following are high bidders in recent sales of Government scrap and semi-finished steel through the Boston ordnance office, 19 Portland Street: 440 tons of cold drawn free cutting Bessemer screw stock in seven lots at the Sterling Motor Car Co., Brockton, Mass., the New England Bolt Co., being only bidder on all lots at an average price of \$29.80 a net ton; 500 tons of steel screw stock, in five lots, at the Worcester Shock Absorber Co., the Buffalo Bolt Co. offering \$29.53 per gross ton; 1000 tons steel screw stock at the Worcester Mfg. Co., the Buffalo Bolt Co. offering \$29.53 per gross ton for all five lots, though the New England Bolt Co. offered \$31.80 per gross ton for one lot of 75,000 lb.; 15 tons of chrome alloy steel, in two lots, at the Shawmut Iron & Wire Works, Everett, Mass., H. Cohen & Co., Chelsea, Mass., bidding an average of \$14.69 per gross ton; 140 tons of cold drawn free cutting Bessemer screw stock at the New Home Sewing Machine Co., Orange, Mass., the Buffalo Bolt Co. offering \$29.53 per gross ton.

Invitations for proposals by the Government include the following:

The United States Ordnance Department, through the New York District Salvage Board, 1107 Broadway, offers for proposals, until 11 a. m., Sept. 2, at the Spaulding & Jennings plant of the Crucible Steel Co. of America, Jersey City, N. J., about 185,627 lb. hot-rolled steel bars, from 1 1/16 to 1 1/16 in. x 11 to 13 ft.

The Pittsburgh office, Chamber of Commerce Building, offers until 11 a. m., Sept. 2, at James McKay Co., McKees Rocks, Pa., about 35,640 lb. hot-rolled steel 1 x 4 in. x 18 ft.; at La Belle plant of Crucible Steel Co., Pittsburgh, about 10,421 lb. trench-knife steel, 3/4 x 1 1/16 in. x 15 to 20 ft.; at Edgewater Steel Co., Oakmont, Pa., about 29,360 lb. 2 in. sq. merchant steel for making ingot eyes; at Superior Steel Co., Carnegie, Pa., about 18,725 lb. hot-rolled open-hearth strip steel, 3/16 x 9 3/4 x 0.1875 in.; at Union Switch & Signal Co., Swissvale, Pa., 380,360 lb. 5 in. steel billets for 10-ton trailer axles; and at Neville Island Storage Depot, Pittsburgh, about 145 tons of 155 mm. thick walled shell forgings.

The Bridgeport office, Liberty Building, offers until 1.30 p. m., Sept. 2, at Corbin Screw Corporation, New Britain, Conn., about 132,778 lb. steel rod in 6-12 and 17 ft. lengths; at American Tube & Stamping Co., Bridgeport, and at Government Warehouse 193, Bridgeport, and at Colts P. F. A. Mfg. Co., Hartford, Conn., a total of about 210,232 lb. cold rolled steel in lengths 10 to 15 ft., hexagonal and round from 3/4 in. to 1 1/2 in.; at Stanley Works, New Britain, Conn., about 42,205 lb. cold rolled strip steel, 0.020 x 2 7/16 in. in coils; at Russell & Erwin Co., New Britain, about 66,079 lb. cold-rolled sheet steel, 0.047 x 3 3/4 in. and 0.030 x 3 3/4 in.; at Colt Patent Fire Arms Mfg. Co., Hartford, Conn., about 294,085 lb. hot-rolled steel in 10 to 22 ft. lengths and various diameters; at Remington Arms U. M. C. Works, Bridgeport, about 120,701 lb. cold-drawn steel in 10 to 12 ft. lengths.

The Cleveland office, 2036 East Twenty-second Street, Cleveland, offers for bids until 1.30 p. m., Aug. 29, at Van Dorn Iron Works, Cleveland, about 1,386,370 lb. rough machined steel castings; at Spencer Engineering Co. and Willys-Overland Co., Toledo, Ohio, about 4,523,020 common steel shell forgings, 8 and 10 in.; at the American Multi-graph Co., Cleveland, about 415,349 lb. cold-rolled steel bars 2 1/4 in. diameter and 10 to 18 ft. long.

The Toronto office offers until 3 p. m., Sept. 2, about 865 lb. steel safety plungers and detonation cap rings for United States consumption.

The Philadelphia office, 1710 Market Street, offers for proposals until 2.30 p. m., Sept. 2, about 2,868,260 lb. McFarlane forgings for 75 mm. shells at Worthington Pump & Machinery Corporation, Hazleton, Pa.

The Baltimore office has placed on sale a variety of machine tools, including lathes, shapers, milling machines, etc., also lots of high speed steel, crucibles, cast iron pipe, located at Bartlett Hayward Co., Columbia Avenue, Baltimore.

The Boston office, 19 Portland Street, offers for proposals until noon, Sept. 2, at Potter & Johnston Machine Co., Pawtucket, R. I., 3635 tons of 155 mm. steel shell forgings; at H. C. Dodge, South Boston, 50 tons (scrap) steel cartridge containers, made from free cutting Bessemer screw stock; at Scituate Proving Ground Storage Plant, Scituate, Mass., about 3 tons (scrap) 155 mm. steel adapters. Bids on the

following are to be in by noon, Aug. 28: 80 tons diagonal Gothic section steel blooms, at Mead Morrison Mfg. Co., Gloucester, Mass.

Rejects Bids for Hangar

WASHINGTON, Aug. 26.—The Bureau of Yards and Docks has rejected all bids for the erection of a dirigible hangar at Lakehurst, N. J. This is to be the largest hangar of its kind in the air service of the Navy. The bids were rejected to make it possible to revise the designs for the construction of this building so as to reduce the cost, particularly as to steel. The original plans called for approximately 9000 tons of steel, while the revised specifications will reduce this estimate to below 8000 tons. A considerable portion of this steel construction consists of railway trackage within the building and its grounds.

The new bids will be opened Sept. 8. The rejected bids ranged in prices for complete construction from \$2,747,000 to \$4,620,000. The bids follow: Underpinning Foundation Co., New York, \$3,145,000; Post & McCord, New York, \$3,042,386; Snare & Triest Co., New York, \$3,144,700; Nugent Construction Corporation, New York, \$3,180,000; McClintic-Marshall Co., Pittsburgh, \$2,929,300; John W. Cowper Co., Buffalo, \$2,974,000; Paschen Bros., Chicago, \$3,194,404; Warren Moore & Co., Philadelphia, \$2,917,407; John Gill & Sons, Cleveland, \$3,227,000; Bethlehem Steel Bridge Corporation, \$3,192,000; Irwin & Leighton, Philadelphia, \$2,747,000; D. L. Taylor & Co., Philadelphia, \$4,620,000; George F. Pawling & Co., Philadelphia, \$2,858,000; C. H. & R. C. Peckworth, New York, \$3,364,514.

Bidding schedules have been issued by the Bureau of Supplies and Accounts of the Navy for a long series of steel plates and other structural steel for the building of tender No. 3, to be named the Dobbin, at the Philadelphia navy yard. Bids will be opened Sept. 9. There are 34 items of plates totaling approximately 3130 gross tons, besides 742 gross tons of angles; 600 tons structural steel and channels, 550 tons of flange material and two tons of half rounds.

Bids will be opened by Surplus Property Division, War Department, at Washington, Sept. 23, for the sale of 9374 steel I beams, 301,000 lb. Bessemer steel sheets, 320,210 lb. steel bars, 37,500 round steel bars, 90,000 bolts. The beams and sheets are at South Schenectady, N. Y., bars at Baltimore and bolts at Washington. The zone supply office at New Orleans will open bids Sept. 18 for 198,140 soft steel plates and 155,800 steel angles.

Will Refund Excess Charges

WASHINGTON, Aug. 26.—The iron and steel industry is vitally interested in an announcement by the Bureau of Internal Revenue that the war taxes collected on overcharges of freight rates are to be remitted to the payers. Heretofore the Interstate Commerce Commission has been powerless to order rebate of the tax on the excessive charges on freight. It could merely order rebate of the amount by which the freight charge itself exceeded the proper figure.

Extensive Housing Project

CHICAGO, Aug. 25.—The Indian Homes Co., a newly incorporated subsidiary of the Inland Steel Co., has acquired several hundred acres in Indiana Harbor, Ind., where it will build 2000 homes, which will be sold to its employees on time. The housing project involves an expenditure of from \$12,000,000 to \$15,000,000, and anticipates the proposed construction of a rail mill and additional sheet mills by the Inland company.

The Wisconsin Manufacturers' Association, at a special meeting of the board of directors at the general offices in Milwaukee, on Aug. 21, decided to undertake a vigorous campaign throughout Wisconsin against Government ownership of railroads and nationalization of industries.

Machinery Markets and News of the Works

FOREIGN INQUIRY

Sweden and Poland in Market for Tools

More than 400 Machines Wanted for Swedish Automobile Plant—Poland to Build Locomotive Repair Shop

Providing credit arrangements can be made and the rate of exchange soon approaches normal, considerable machine-tool business with Europe is possible. An inquiry for 433 machine tools for an automobile plant in Sweden is in the market, and several exporters are very actively figuring on it, but it is doubtful if the orders will be placed with the rate of exchange standing against Sweden. Poland wants about 200 machines for a locomotive repair shop, but in this case financial arrangements are lacking, but probably will be made. Another inquiry comes from the Finnish State Railways for about \$50,000 worth of tools, but this business probably will go to England as there is no international exchange between United States and Finland.

Japan is figuring largely in the export market. One company reports an order for \$50,000 worth of tools, and another exporter is figuring on a list for a shipyard running into several hundred thousand dollars.

New York

NEW YORK, Aug. 26.

Foreign inquiry is the feature of the machine-tool market, most of this coming from Japan and European countries. Japan is the only country that is actually buying American machine tools in volume, but other countries would undoubtedly place good-sized orders if it were not for the unfavorable exchange rate. There is an inquiry in the market for 433 tools for a complete automobile manufacturing plant in Sweden, but actual purchasing may be postponed until the exchange situation between the two countries is more nearly normal. One of the companies which is figuring on the list is A. B. Galco, Ltd., 8 West Fortieth Street, which represents a number of leading American machine-tool builders in Sweden. Included in the list are 90 engine and screw-cutting lathes, 12 special tool lathes, 107 turret and automatic lathes, 73 milling machines, 34 grinders, 54 drill presses, 40 planers, shapers and gear cutters and the remainder of the list is made up of miscellaneous machines.

There is said to be a big demand for automobiles in Sweden, especially American machines. A few French cars are on the market, but their price is so high that only the wealthy can purchase them. Three or four German companies are getting into production, one of these, the Adler Co., being about to resume the manufacture of a high-priced car. A. G. Gullberg, general manager of the Swedish Automobile Mfg. Co., Bollnas, Sweden, is in the country trying to arrange for the purchase of several hundred light engines for a car which that company will assemble in Sweden.

As stated in *THE IRON AGE* last week, the demand for American machine tools in Sweden is very good, and only the exchange rate prevents a very satisfactory business being done at the present time. Several Swedish dealers have arrived in this country and are purchasing second-hand tools, which they will ship to Sweden, their purchases being purely on a speculative basis.

Poland is in the market for about 200 machine tools for a locomotive repair shop, but credits will first have to be arranged. In connection with the sale of 150 locomotives to Poland by the Baldwin Locomotive Works, Philadelphia, that company arranged its own financing. It is reported in the trade that the Baldwin company may also equip Poland's locomotive repair shop. Since perfecting its new world-wide selling organization, the Baldwin Locomotive Works has

There is considerable apprehension among American tool builders and exporters that Germany may recover her former position in Europe as a seller of machine tools, particularly as the low value of the mark makes it very advantageous for neighboring countries to do business with her.

The Baldwin Locomotive Works has placed an order with the Niles-Bement-Pond Co. for 16 overhead cranes for a new cylinder shop.

Considerable second-hand machinery is making its appearance in the market. The American Can Co. will offer at auction on Sept. 3 to 6 the contents of its factories at Edgewater, N. J., including several hundred machine tools. From \$20,000,000 to \$30,000,000 worth of used tools have been assembled at a Government storage depot in Chicago. Of these 60 per cent are single-purpose machines, which will have to be scrapped or held for future emergencies. A Belgian commission is now in this country examining Government surplus tools and at the conclusion of its trip will purchase the tools it desires.

The Chicago trade reports orders aggregating \$50,000 from the Sundstrand Adding Machine Co., Rockford, Ill., and there are a number of other fair-sized orders. The Philadelphia market has improved considerably, and several sellers report current business as very satisfactory.

arranged to sell machine tools and other railroad equipment as well as locomotives.

The Finnish State Railways are inquiring through Iznoskoff & Co., Singer Building, New York, for about \$50,000 worth of machine tools, but it seems probable that this business will go to England, as there is no international exchange between the United States and Finland. England is also to do business with Finland because she takes dairy products in exchange for whatever machinery or other merchandise she sells to that country.

Japan has figured actively in the export market. One company reports an order for \$50,000 worth of lathes, planers, milling machines, shapers and upright and radial drills. Another exporter is figuring on a list sent over by its Yokohama representative calling for several hundred thousand dollars worth of horizontal and vertical boring mills, universal milling machines, lathes, pneumatic hammers and other equipment for a Japanese shipyard.

Among American exporters and builders of machine tools there is some apprehension that Germany may recover her former position in the European countries in the selling of machine tools. The low value of the German mark has made it very advantageous for European countries to place orders in Germany, especially in view of the fact that the exchange rate between those countries and the United States is so extremely unfavorable. For example, it costs a French manufacturer the equivalent of \$1.60, at the normal valuation of the franc, to purchase a dollar's worth in the United States. It is feared that some French and Belgium business may go to Germany. Even though their inclination is to buy in this country, the great savings to be effected by buying in Germany may force them to do this in self-protection. The loan situation is also said to be unfavorable for some of the European countries, and in this connection it is noted by the machinery trade that Belgium has taken out only \$14,000,000 of the recent \$50,000,000 loan which she was granted by American bankers.

The Standard Oil Co. of New Jersey has not, at this writing, closed on a list of 70 or 80 machine tools for shipment to Rumania, but this buying is likely to be done soon. A small list of tools for Mexico has been sent out by the Standard Oil Co.

Domestic business has shown a falling off in August as compared with July, the latter month having been the best this year with many sellers of machine tools and allied

equipment. Prices on lathes and planers have now been advanced by practically all makers until they are within close range of the prices which prevailed at the end of the war. The advances recently put into effect are almost equal to the reductions which were made in the spring.

A small list of tools has been bought by the New York Central Railroad. Further railroad buying is expected to develop soon, as the rolling stock of nearly all roads is known to be in bad condition, necessitating a great deal of repair work before the more serious traffic conditions of the winter months develop. General inquiry from New England has been very good and a good business is being done in that territory by New York sellers, though the orders are almost entirely for small lots, widely scattered. The printing press manufacturers have lately come into the market for new equipment.

Two important changes of ownership of Eastern plants have taken place which will probably result in machine-tool buying. The plant of the Duesenberg Motors Corporation, Elizabeth, N. J., which was at work during the war on Bugatti airplane motors, has been acquired by the new Willys Corporation, and 15,000 six-cylinder motors, probably for the new Willys automobile, will be manufactured at that plant. The Duesenberg Motors Corporation, a subsidiary of the American Can Co., was engaged before the war in the manufacture of motor-boat engines. A new plant was built during the war and fully equipped. The plant of the International Arms & Fuze Co., Bloomfield, N. J., will probably pass very soon to the General Motors Corporation, negotiations for its sale having been in progress for some weeks. The Bloomfield plant was engaged in making shells and small parts during the war. During recent months most of its equipment has been sold, but the buildings which are largely new, are well suited for automobile manufacturing. Just what use the General Motors Corporation will make of the property has not been announced.

More second-hand machine tools are appearing on the market. The American Can Co. has announced that a public auction will be held at its Edgewater, N. J., plant on Sept. 3, 4, 5 and 6, at 11 a. m. on each day, and all of the shell-making equipment in its 12 buildings will be offered for sale. The list includes 400 engine lathes, 350 hand screw machines, 75 power presses, 75 drill presses, 150 grinders, 25 milling machines, 125 cutting-off machines, 125 marking, tapping and banding machines, 300 motors, 50 steel tanks, 25 furnaces, 3655 ft. of Matthews conveyor, an acetylene generator plant complete and a large quantity of other miscellaneous supplies. For the convenience of those who wish to attend the sales a boat will leave the foot of West 95th Street, New York, beginning at 7:30 a. m. and making half-hourly trips. The Marlin-Rockwell Corporation, New Haven, Conn., is offering considerable second-hand equipment for sale. As to the large stock of machine tools held by the War Department, it appeared from President Wilson's statement to the Senate Committee on Foreign Affairs last week that no disposal of this stock would be made until the peace treaty is signed. President Wilson said: "The vast surplus properties of the army include, not food and clothing merely, whose sale will affect normal production, but great manufacturing establishments also which should be restored to their former uses, great stores of machine tools, and all sorts of merchandise which must lie idle until peace and military policy are definitely determined."

One of the largest purchases of cranes by any industrial plant in some time has been made by the Baldwin Locomotive Works, Philadelphia, which has bought 16 overhead electric cranes, eight of 10-ton and eight of 20-ton capacity, from the Niles-Bement-Pond Co. This equipment is for a new cylinder shop at Eddystone, Philadelphia. Some machine-tool equipment has also been purchased for this new shop. The Midvale Steel & Ordnance Co., Philadelphia, is in the market for four 10-ton overhead bridge cranes and one 75-ton ladle crane for the Cambria works at Johnstown, Pa., and also for a 40-ton ladle crane for the Coatesville, Pa., works. The China, Japan and South America Trading Co. is in the market for two 17-ton cranes for export. Orders placed include a 30-ton crane for the plant of the U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J., and a 10-ton crane for the American Shell Co.'s plant at Paterson, N. J. The inquiry of the American Locomotive Co. for 13 cranes, issued a few weeks ago, is still pending.

The Atlantic Smelting & Refining Works, 57 Richards Street, Brooklyn, N. Y., has completed plans for the main building at its new plant on Avenue R, Newark, N. J., comprising a one-story structure, 100 x 265 ft., with adjoining metal foundry, 75 x 100 ft., to cost about \$100,000. A wire-drawing department, 100 x 100 ft., will be installed; two foundries, for handling red and white metals, respectively, will be established. William E. Lehman, 738 Broad Street, Newark, is architect.

The Perfection Tool & Machine Co., Newark, N. J., has

filed notice of organization to operate a manufacturing shop at 320 Market Street. Morris Schwartz heads the company.

The British-American Rotary Valve Co., Jersey City, N. J., has been incorporated in Delaware with capital of \$1,500,000 by Edward Eriksen, Sr. and Jr., and Harry Eriksen to manufacture valves, etc.

The Drop Forging Co. of New York, 301 Westside Avenue, Jersey City, N. J., has filed plans for a two-story reinforced concrete addition to cost \$37,000.

The Perth Amboy, N. J., plant of the National Fireproofing Co., Pittsburgh, has resumed operations after a shut-down since June, 1916. All departments of the works, which are devoted to the production of hollow tile, will be run, including machine shop, forge shop and other mechanical branches.

The United States Cast Iron Pipe & Foundry Co., Burlington, N. J., has awarded a contract to the Foundation Co., Pittsburgh branch, for the erection of a 2½-story addition to the machine shop, 120 x 344 ft., at its Addyston, Ohio, works, River Road, to cost about \$300,000, including equipment.

The Front Drive Motor Co., Hoboken, N. J., has filed plans for a one-story extension at Sixteenth Street and Willow Avenue.

The Brooklyn Rapid Transit Co., 85 Clinton Street, Brooklyn, through its receiver, Lindley M. Garrison, has sold an issue of receiver's certificates, aggregating \$18,000,000. The proceeds of not less than \$13,000,000 or more than \$15,000,000, will be used in part for power plant work, including the erection of power stations, extensions in present plants, improvements and betterments.

Charles A. Grice & Co., New York, have been organized to manufacture power presses and pumping machinery. Charles A. Grice, John J. Kling and Standish Chard, 45 East Sixty-second Street, head the company.

The M. R. Shafter Co., New York, has been incorporated with a capital stock of \$20,000 by M. R., V. F. and B. J. Shafter, 3750 Broadway, to manufacture automobile equipment, parts, etc.

The Hat & Coat Hanger Co., Belvidere, N. J., has been incorporated with a capital stock of \$100,000 by G. Howell Mutchler, Martin C. Swartsweller and Oscar G. Smith, to manufacture metal hangers.

The Athenia Steel Co., Athenia, N. J., has awarded a contract to J. J. O'Leary, 500 Bloomfield Avenue, Passaic, N. J., for a one-story addition, 100 x 150 ft.

The E. W. Bliss Co., Adams and Plymouth streets, Brooklyn, manufacturer of presses, etc., has acquired from the Pennsylvania Railroad a block of waterfront property, near the Long Wharf, Sag Harbor, Long Island, with four-story mill building now on site. The Bliss company now has a machine shop on part of the property.

The Columbia Graphophone Co., Woolworth Building, New York, with plant at Bridgeport, Conn., has increased its capital from \$30,000,000 to \$165,000,000. The Bridgeport works have been closed down, due to a strike of employees, and the company has issued a notice that the plant will be moved to another city unless an agreement can be reached and the workers return.

The United States Automatic Steam Iron Corporation, New York, has been incorporated with a capital stock of \$10,000 by L. Lichtman, S. G. Buskard and N. Komow, 414 West Broadway, to manufacture automatic pressing irons and equipment.

The American Bosch Magneto Corporation, 223 West Forty-sixth Street, New York, has acquired property, 73 x 100 ft., on Sixtieth Street, near Broadway, as a site for a new building. It is planned to construct a 10-story factory and salesroom, with estimated cost at \$700,000.

The Miller Safe & Lock Co., New York, has been organized by H. B. and H. D. Brassington, and C. P. Jackson, 319 Canal Street, to manufacture locks, safes, etc.

P. Kleppe & Co., Inc., New York, has been incorporated with a capital stock of \$25,000, by P. S., and K. A. Kleppe, 11 Broadway, to manufacture motors, ship equipment, etc.

The American Shell Co., an interest of T. A. Gillespie Co., 50 Church Street, New York, with plant at Paterson, N. J., has filed notice of change of name to the Gillespie Motor Corporation. Its plant at Twenty-first Avenue is being converted from a munition works to a plant for the production of motors, Diesel type engines, centrifugal equipment, screens for sewerage work, etc. Plans have recently been prepared for a new one-story foundry, 120 x 240 ft., to cost about \$100,000. Coincident with change in name of its subsidiary, the Gillespie company, a Delaware corporation, has increased its capital from \$500,000 to \$5,000,000.

The Morse Dry Dock & Repair Co., foot of Fifty-sixth Street, Brooklyn, has completed negotiations for the purchase of all of the remaining waterfront property on the

Staten Island shore of New York Bay, between the Fort Worth reservation and property of the city of New York, comprising about two acres. The price is said to be about \$150,000. The company plans for a new ship works in this section to cost about \$1,000,000.

The Jackson Co., New York, has been incorporated with a capital stock of \$25,000 by H. E. Morrison, 233 Broadway, New York; W. H. Jackson, 4866 Southern Boulevard, and G. S. Scofield, 120 Vanderbilt Avenue, Richmond Borough, to manufacture machinery, tools, snap fasteners, etc.

Charles Cory & Son, 290 Hudson Street, New York, manufacturer of ships, engine bells, electric-operated apparatus, etc., is having plans prepared for a six-story reinforced-concrete addition, 140 x 175 ft., to cost \$200,000. Russell J. Cory, 39 Cortlandt Street, is engineer.

The Boyce Veeder Corporation, New York, has been incorporated with a capital stock of \$75,000 by H. H. Boyce, P. L. Veeder and J. W. Truesdale, 259 East Eighty-second Street, to manufacture fire extinguishers, etc.

The Winhar Mfg. Corporation, New York, has been incorporated with a capital stock of \$250,000 by G. E. Baer, D. S. Brower and F. A. Barry, 383 Flatbush Avenue, Brooklyn, to manufacture hot-water and steam boilers.

The Sedgwick Machine Works, 150 West Fifteenth Street, New York, has increased its capital stock from \$75,000 to \$150,000.

The Royal Typewriter Co., 364 Broadway, New York, is considering the erection of an addition on New Park Avenue, Hartford, Conn., for increased production. Preliminary plans are being prepared and negotiations are under way for certain changes in the local building code to allow the proposed construction. Greenwood & Noerr, 847 Main Street, Hartford, are consulting engineers.

The Everlasting Valve Co., 49 Fisk Street, Jersey City, N. J., has increased its capital stock from \$600,000 to \$1,200,000.

The Metal Stamping & Mfg. Co., Newark, N. J., has been incorporated with a capital stock of \$100,000 by Harry Green and N. M. Frutchman, Newark, to manufacture metal products.

The National Lock Washer Co., 65 Johnson Street, Newark, N. J., has had plans prepared for a one-story plant addition to cost \$20,000.

The Lux Mfg. Co., 121-33 East Kinney Street, Newark, N. J., manufacturers of tungsten lamps, has arranged for a stock issue of \$100,000 for proposed expansion. It has acquired property adjoining the present works for construction of an addition at a later date. A. T. Baldwin is treasurer.

G. Lee Stout, Jr., Newark, N. J., has leased the property at 30 West Kinney Street for the manufacture of shock absorbers. A company has been organized under the name of the New Jersey Parts Co. to operate the business.

The Transfer Metal Castings Co., Newark, N. J., has filed notice of organization to manufacture castings, with works on Doremus Avenue. William Karnatz, 133 Chestnut Street, and Joseph Keegan, 85 Somme Street, head the company.

The American Incubator Mfg. Co., Newark, N. J., has been incorporated with a capital stock of \$125,000 by Morris H. Cohn, A. Milton Jacobs and Wallace M. Norton.

Joseph F. Guffey, director bureau of sales, office of the Allen Property Custodian, Francis P. Garvin, 110 West Forty-second Street, New York, has announced the sale of the property of the Bruckmann Can Machinery Co., Merchants Exchange Building, San Francisco, Cal., on Sept. 13.

Clark & Kendrick, Inc., 143 West Fifty-first Street, New York, manufacturer of automobile bodies, has leased a three-story building now being erected at 126-134 West Fifth Street, for a new works.

The Frank Motor Products Corporation, New York, has been incorporated with a capital stock of \$55,000 by L. S. and H. S. Frank and L. B. Miller, 566 West 162d Street, to manufacture piston rings, etc.

The Thatcher Propeller & Machine Co., Learned Street, Albany, N. Y., has had plans prepared for alterations and extensions in its forge shop to cost about \$8,000. George H. Thatcher is president.

The Ordnance Department, Washington, has awarded a contract to Feeney & Sheehan, 165 Montgomery Street, Albany, N. Y., for improvements in the one-story cannon shop at the Watervliet, N. Y. Arsenal, to cost about \$70,000.

The Canopus Iron Corporation, operating properties near Peekskill, N. Y., has commenced the construction of an aerial tramway from its plant to its private dock at Peekskill. Other plant improvements will be made. The company specializes in the production of magnetic iron ore for steel mill use.

The Utica Heater Co., Lafayette Street, Utica, N. Y., is having plans prepared for three one-story plant additions to cost about \$20,000.

The Eureka Mower Co., Utica, N. Y., manufacturer of lawn mowers and agricultural implements, is considering the erection of a two-story addition, 61 x 129 ft., to cost about \$40,000. E. L. Newcomer is manager.

The Mechanical Tire Co., Mount Vernon, N. Y., has increased its capital stock from \$10,000 to \$100,000.

The Utica Knitting Co., Utica, N. Y., is having plans prepared for a machine shop addition, 60 x 69 ft., on Matthews Street, to cost \$15,000.

Catalog Wanted

C. Hartlett, Acting Canadian Trade Commissioner at Melbourne, Australia, announces that he has received a letter from H. R. Harper, chief engineer to the Electricity Commissioners recently appointed in the State of Victoria to erect and operate a large power plant on the Brown coal fields, about 90 miles from Melbourne, for the generation and transmission of electricity to that city, respecting electrical machinery and material required for this undertaking. Tenders for the requisite machinery and material will be called for in about nine months, and manufacturers will be given ample opportunity to consider the specifications and submit bids. Meantime, in order that the Chief Engineer may familiarize himself with the latest type of machinery, manufacturers interested are invited to submit catalogues for: Boiler house, coal and ash-handling, and coal-mining machinery; turbo-generators; condensing plants; fans; rolled structural sections; electric storage batteries; machine tools, traveling cranes, vacuum exhausters, air compressors, electrical instruments; switch gear; transformers; water turbines; briquetting machinery; gas producers with by-product recovery; coal-pulverizing machinery, etc.

New England

Boston, Aug. 25.

The improvement in the machine tool situation continues. The feeling that prices must advance beyond any point previously reached has become accentuated with the constantly increasing costs of manufacture. Skilled labor is becoming so scarce that the law of supply and demand is asserting itself and wages gradually increase. Tool makers are attaining the important place that they occupied during the war, and while the demand for their services is not so great they are averaging fully as high wages.

The purchasing agent for one of the large metal-working plants of New England has studied the prices paid by his company and finds that there is hardly an exception to the rule of increase. A few of the great staples, such as steel, copper and spelter, have fluctuated, but everything else has been constantly getting bigger in figures.

The A. Burlingame Co., Worcester, Mass., has purchased the property adjacent to its shops on Cypress Street, consisting of a three story brick building, having floor space available for machine shop purposes of 10,000 sq. ft. The structure will be renovated and the company will double its present capacity. The business is one of the oldest of its kind in central Massachusetts. Formerly it specialized in building steam engines and still carries on this work, but it also does a general repair shop business, and deals in transmission machinery and supplies.

The Simplex Piano Action Co., Worcester, Mass., a constituent corporation of the Conway Co. of New Jersey, is planning for another addition to its factory, work to begin in September. The details are not completed, but the company states that the building will contain from 15,000 to 20,000 sq. ft. of floor space. Considerable machinery has been purchased of late and the requirements for this addition will probably not be large.

The M. B. Schenck Co., Center Street, Meriden, Conn., a division of the Bassick Co., Bridgeport, Conn., manufacturer of castors, metal stampings, hardware, etc., has awarded a contract for the erection of a two-story addition, 45 x 60 ft., to cost about \$14,000, to the H. Wales Lines Co., Meriden.

The Bridgeport Electric Products Co., Bridgeport, Conn., has filed notice of a change of name to the Liddell Electric Mfg. Co.

The Harvey Hubbell Co., Bridgeport, Conn., manufacturer of electrical switches, plugs, etc., has commenced the erection of a one-story addition to its plant on Lesbia Street, 82 x 140 ft., to cost about \$18,000.

The New Departure Mfg. Co., Bristol, Conn., manufacturer of ball bearings, is said to be negotiating with the Colt Patent Firearms Mfg. Co., Hartford, Conn., for the purchase of its branch plant at Meriden. The New Departure company is planning for extensive increase in operations.

The Safe-Seal Mfg. Co., Hartford, Conn., has been incorporated with a capital of \$10,100 by E. W. Putnam, 183 Oxford Street, Hartford, and E. A. Backus, Thompson, Conn., to manufacture electric-heating devices and other specialties.

In connection with the erection of an addition to its webbing works, the Russell Mfg. Co., Middletown, Conn., will build an extension to its power plant, to include one-story turbine department, 20 x 20 ft.; two-story engine and pump house and one-story boiler plant.

The New England Auto Accessories Corporation, 50 Main Street, Norwalk, Conn., will build a two-story manufacturing plant, 80 x 150 ft., at West Avenue and Berkeley Street.

In addition to the sale of a portion of the Bridgeport, Conn., plant of the Remington Arms Co., as announced in THE IRON AGE of Aug. 7, the company is also arranging for the disposition of its works at Swanton, Vt., comprising a two-story concrete building with about 80,000 sq. ft. of floor space, and series of one-story structures aggregating 50,000 sq. ft.

The Electric Automatic Machine Co., Inc., Hartford, Conn., has filed notice of dissolution.

The Albion Tool Co., Providence, R. I., has established a works at 99 Sabin Street, for the manufacture of fine tools for jewelers' service.

The Norwalk Tire & Rubber Co., Norwalk, Conn., has completed arrangements for the erection of the proposed addition to its plant, to consist of a five-story factory, 85 x 160 ft.

The Metal Ball Co., Danbury, Conn., manufacturer of ball bearings, etc., is planning to double the capacity of its works. George E. Crawford is president and Walter P. Clark, formerly of the Bullard Machine Tool Co., is treasurer.

The addition to the plant of the Bridgeport Brass Co., Bridgeport, Conn., will be used for extensions in the castings department. It will be one-story, brick and concrete, 150 x 225 ft., and with equipment is estimated to cost about \$150,000. The H. M. Lane Co., engineer, Owen Building, Detroit, Mich., is preparing plans.

The Hartford Electric Co., Hartford, Conn., is planning for the erection of a new power plant at Colt's Meadows, with initial capacity of about 100,000 kw., designed to use oil as fuel. Plans will be prepared by the Stone & Webster Co., Boston, Mass.

The Hobbs Mfg. Co., Worcester, Mass., manufacturer of cutters, etc., will build a one-story addition, 35 x 60 ft., to its steel-hardening department on Salisbury Street.

Buffalo

BUFFALO, Aug. 25.

The Elbridge Automobile Corporation, Buffalo, has been incorporated with a capital stock of \$500,000, to manufacture motors and parts. The incorporators are Francis C. Owen, J. E. McOmber, New York City, and D. H. MacCarriagher, 318 Erie County Bank Building, Buffalo.

The Wolff Machine Co., Buffalo, recently incorporated by W. E. and L. Wolff, has established its factory at 23 Clare Street.

The Northwestern Telephone Corporation, Carthage, N. Y., will erect a two-story machine shop to cost \$20,000.

The Eastman Kodak Co., Rochester, has awarded general contract to the Ferro Concrete Construction Co., that city, for a factory building, 99 x 421 ft., two and five stories, to cost \$225,000.

The Brunner Mfg. Co., Utica, N. Y., manufacturer of air compressors, has completed plans for factory addition, 76 x 140 ft., one story, to cost \$15,000.

The North East Electric Co., 348 Whitney Street, Rochester, has awarded contract for a factory addition, 86 x 198 ft., two stories, at Lyell Avenue and Whitney Street, to cost \$60,000.

Reece-Hilton, Inc., Troy, N. Y., has filed articles of incorporation with a capital stock of \$50,000, to manufacture tools and implements. R. and A. L. Reece and R. C. Hilton are the incorporators.

The Katterman & Mitchell Co., Port Jervis, N. Y., has let contract for the erection of a factory, 52 x 218 ft., at Cornell Street and Ten Broeck Avenue, Kingston, N. Y., to cost \$70,000.

The Utica Heater Co., Utica, N. Y., is having plans drawn for three one-story additions to cost \$20,000. E. I. Hodges is manager.

The Buffalo Foundry & Machine Co., 1543 Fillmore Avenue, Buffalo, has awarded a contract to the B. S. Crocker

Co., Builders' Exchange, for a two-story and basement addition, 70 x 77 ft., on Fillmore Avenue.

The Westcott Valve Co., Erie, Pa., is planning for the immediate erection of a plant at Seneca Falls, N. Y., to cost about \$25,000 and employ 150 persons. Frank Cavenagh is vice-president and treasurer.

The Clemens Electrical Corporation, 725 Main Street, Buffalo, manufacturer of electrical specialties, has increased its capital stock from \$100,000 to \$250,000.

The New Departure Coaster-Brake Corporation, Buffalo, has been incorporated with a capital stock of \$200,000 by B. Lockwood, E. H. Kelly and F. A. Gaynor, 43 Cedar Street, New York, to manufacture coaster-brakes for bicycles, etc.

The Erie Tire & Rubber Co., Erie, Pa., is considering the erection of a five-story addition to cost about \$200,000. A. E. Philip is secretary and treasurer.

The Rickert-Shafer Co., Erie, Pa., manufacturer of die-heads, etc., is planning for the erection of a two-story plant extension, 33 x 150 ft., on West Eleventh Street, to cost \$30,000.

The Kellogg Mfg. Co., 3 Circle Street, Rochester, N. Y., manufacturer of air pumps, etc., has arranged for a preferred stock issue of \$100,000, in connection with its expansion plans. The company recently increased its capital stock from \$75,000 to \$300,000.

The Corporation Pattern Works, Rochester, N. Y., has been organized to manufacture mechanical pattern specialties. George J. Fink and William H. Kramer head the company.

The Syracuse-Overland Co., 245 West Water Street, Syracuse, N. Y., will build a new three-story repair works and service shop, 100 x 100 ft., on Drake Street, to cost about \$45,000.

The Crane Co., Chicago, manufacturer of valves, fittings, etc., has leased the former plant of the R. T. Ford Co., 200 South Avenue, Rochester, N. Y., maker of plumbing and steam-heating specialties, for a new local establishment. The company plans to occupy the building in September.

Flesch & Schmitt, 123 Andrews Street, Rochester, N. Y., manufacturers of cornices, have broken ground for their proposed shop at Brown and Jones streets, to cost about \$15,000.

E. Moreness & Co., Cleveland, N. Y., manufacturers of thermometers and allied specialties, is planning for a two-story plant addition, 30 x 100 ft., to cost \$10,000.

Motor Hall, Inc., Buffalo, has been incorporated with a capital stock of \$25,000 by C. M. Baldy, T. R. Wheeler and H. F. Cunningham, to operate a machine repair works and automobile service plant.

The American Locomotive Co., Schenectady, N. Y., has completed plans for a one-story shop addition at Dunkirk, N. Y., 70 x 245 ft., to cost \$70,000.

The Hauser Machine & Mfg. Co., Rochester, N. Y., has increased its capital stock from \$50,000 to \$200,000.

The Dual Tractor Co., Rochester, N. Y., has been incorporated with a capital stock of \$10,000 by L. B. and J. E. Horton and R. S. Redfern, to manufacture tractor parts.

The Chapin-Baker Co., 143 Edison Street, Syracuse, N. Y., manufacturer of automobile parts, etc., is planning for a one-story addition, 42 x 70 ft., to cost \$10,000.

Philadelphia

PHILADELPHIA, Aug. 25.

Several of the leading sellers of machine tools report that business conditions are very satisfactory. One company states that its business last month was better than some months during the war, and August orders have been at a very fair rate. There is some hesitation among buyers on account of fear of labor troubles, but this is believed to be a passing phase.

Railroad buying has been a conspicuous feature, and although this has not assumed large proportions it is pointed to as an indication that the railroads have reached a point where betterments must be provided whether their financial situation justifies such expenditures or not. Most of the equipment bought by the roads is for repair shops. Many thousands of cars are badly in need of repairs, which must soon be made if there is not to be a serious breakdown in transportation during the winter months. The Philadelphia & Reading has bought about \$25,000 worth of tools and purchases have also been made by the Baltimore & Ohio and the Cambria & Indiana roads. The Pennsylvania Lines East have not bought, but the Pennsylvania Lines West have been placing fair-sized orders at Pittsburgh.

There has also been some buying by companies engaged in automobile manufacturing. The North American Motors

Co., Pottstown, Pa., has bought about \$40,000 to \$50,000 worth of new equipment, mostly multiple spindle drills and special machines. The Autocar Co., Ardmore, Pa., has also added new equipment for the manufacture of four-cylinder motors to be used in trucks of larger capacity than the company has heretofore manufactured.

The Sherritt & Stoer Co., machine tool dealer, Finance Building, has purchased property at 2006-08 Market Street and is erecting a three-story office and warehouse building, which will be ready for occupancy about Jan. 1. There will be ample space in the building for the display of the various lines of tools distributed by this agency. Some years ago nearly all of the leading machine-tool sellers in Philadelphia maintained show rooms, some of them having exhibits in the Bourse or in that vicinity. A few years ago, the machinery district moved uptown, and now nearly all of the companies have offices in buildings within a radius of a few blocks of the Broad Street station. Show rooms were abandoned when this change took place.

The Pennsylvania Railroad, Broad Street Station, Philadelphia, is planning for a new car repair shop at Lebanon, Pa., to consist of one-story structures. Construction will be inaugurated at once.

The Edward Darby & Sons Co., 412 North Eighteenth Street, Philadelphia, manufacturer of iron and wire products, has filed articles of incorporation as the Edward Darby Sons Co., with a capital stock of \$100,000, to manufacture hardware and other specialties. J. A. Longacre, Norristown, Pa., is an incorporator.

The Traveler Tire & Rubber Co., 819 North Broad Street, Philadelphia, has awarded a contract to Butz & Clader, Allentown, Pa., for its proposed one-story plant, 91 x 333 ft., in Lower Saucon Township, near Bethlehem, Pa., to cost about \$180,000 with equipment.

The Keystone Wagon Works, 1949 North Second Street, Philadelphia, is having plans prepared for a three-story, brick addition at Second and Morris streets, 45 x 109 ft., and 60 x 74 ft.

The Wirt Co., Armat and Lena streets, Philadelphia, manufacturer of electrical specialties, has filed plans for a new two-story plant, 62 x 158 ft., at Greene Street and Queen Lane, to cost \$60,000. Charles Wirt is president.

The Ridpath & Potter Co., Bourse Building, Philadelphia, artesian well supplies, is taking bids for a two-story factory and repair shop, 46 x 75 ft., at Fox and Ontario streets.

Connery & Co., Second and Luzerne streets, Philadelphia, manufacturers of boilers, are planning the immediate erection of their proposed one-story assembling shop, 75 x 90 ft.

The working force at the shipyard of Pusey & Jones, Gloucester City, N. J., is being reduced from week to week, as work is completed, and no new construction work is being inaugurated. About 2500 men are now engaged at the yard as against 6000 men at the close of the war.

The Woodhouse Chain Works, Third and Schenck streets, Trenton, N. J., has incorporated the William Woodhouse Chain Mfg. Co., under Pennsylvania laws, with a capital stock of \$25,000 and headquarters at Edgely, Pa., where the company has a plant. William Woodhouse, Trenton, heads the company.

The John A. Roebling's Sons Co., South Broad and Canal streets, Trenton, N. J., manufacturer of wire, wire rope, etc., has filed plans for a two-story building on South Clinton Avenue, to cost about \$20,000.

The Ajax Rubber Co., Trenton, N. J., manufacturer of tires, has arranged for a new stock issue of \$2,520,000, the proceeds to be used for expansion.

The Woven Steel Hose & Rubber Co., Dale Street, Trenton, N. J., has filed plans for a one-story extension on Prospect Street.

An appropriation of \$150,000 has been approved by the Board of City Commissioners, Trenton, N. J., for new pumping equipment at the municipal waterworks, to provide for increased capacity and for emergency service. E. E. Brownell, 1418 Walnut Street, Philadelphia, engineer, will be in charge.

The Thomas Maddock's Sons Co., Ewing and Perry streets, Trenton, N. J., manufacturer of sanitary wares, has awarded a contract to Lewis Lawton & Sons, Broad Street Bank Building, for an addition to cost about \$50,000.

The Wilkes-Barre Iron & Wire Works Co., Wilkes-Barre, Pa., has been incorporated with a capital stock of \$10,000 to manufacture iron and steel specialties. T. H. Mead, Scranton, Pa., is the principal incorporator.

The American Metallurgical Corporation, Franklin Trust Building, Philadelphia, is planning for a one-story addition at Conshohocken, Pa. Improvements will also be made in the present building.

A power plant will be built by the Chester Hospital.

Chester, Pa., in connection with a new surgical pavilion. The entire work will cost \$260,000.

The Clearfield Textile Machine Co., Philadelphia, manufacturer of textile machinery with plant at 1826 East Clearfield Street, has been incorporated with a capital stock of \$100,000. Carl Klenk is one of the principal incorporators.

The new shops and yards of the Philadelphia & Reading Railroad, Reading Terminal, Philadelphia, at Bethlehem, Pa., near the plant of the Bethlehem Steel Co., are nearing completion, and will be placed in full operation at an early date. The plant includes engine house, machine shop, power plant, coaling station, and other structures, and with new classification freight yards, represent an investment of about \$1,000,000.

Baltimore

BALTIMORE, Aug. 25.

The Canion Rim Co., 563 Calvert Building, Baltimore, has been incorporated by William R. Gunn, Loga E. Stille and Edward F. Johnson to manufacture a patent automobile rim.

For the purpose of manufacturing aluminum solder and other metals, alloys, mixtures of metals, etc., the Federal Mfg. Co., 900 Maryland Trust Building, Baltimore, has been incorporated by James T. Carter, Edward P. Keech, Jr., and A. Charles Gregson.

Fire, Aug. 20, destroyed a large part of the plant of Sherwood Brothers, oil refiners, Bank and Eighth streets, Baltimore, with damage estimated at about \$1,000,000. The plant will be rebuilt.

C. L. Reeder, engineer, Park Avenue and Saratoga Street, Baltimore, is preparing plans for a 600-hp. power plant for the State Hospital, Crownsville, Md.

The Bethlehem Shipbuilding Corporation, Sparrows Point, Md., contemplates the construction of an additional floating drydock to be 400 ft. long, 80 ft. wide and 20 ft. deep, which will be equipped with electric power.

I. Copeland, Richmond, Va., will build a garage to cost about \$35,000.

B. C. Cook, Charlotte, N. C., will build a two-story building for the manufacture of belting, 50 x 150 ft. The contract has been awarded to J. F. Cashlon, Charlotte.

The Apex Motor & Machine Co., Apex, N. C., recently incorporated, will build a garage and machine shop 32 x 135 ft. J. A. Dean is president.

The Jones Motor Co., Wilmington, N. C., plans to build a garage to cost \$50,000.

J. H. Clinard, Winston-Salem, N. C., has awarded a contract to Lancaster Brothers & Son, for a garage, 80 x 100 ft., to cost about \$12,000.

The Cape Fear Fish Fertilizer Co., Southport, N. C., is interested in prices on four 150-hp. boilers and six 25 to 100-hp. engines. C. L. Cotton is manager.

The Jones Iron Works, Rock Hill, S. C., recently incorporated, has selected the following officers: T. L. Johnson, president; E. G. Jones, vice-president and secretary, and A. F. Ruff, treasurer.

The City Garage, Williston, S. C., will build a garage and install drilling, welding and other machinery. C. H. Trotti is manager.

The Ebenezer Brick Co., Newport, S. C., is interested in quotations on 50-hp. boilers and engines.

The Southern Spring Bed Co., Atlanta, Ga., will rebuild the structure recently burned.

Prices on machine-shop equipment are wanted by the Valdosta, Moultrie & Western Railway, Valdosta, Ga.

The Baltimore Spring Works, 118-20 Dolphin Street, Baltimore, is planning for a three-story addition.

Following the erection of the initial buildings at its proposed plant fronting on the Pennsylvania Railroad, the Canion Airbrake Co., Calvert Building, Baltimore, will build a pattern shop, foundry and additional machine shop. The first building, a machine shop, will be equipped for the manufacture of triple valve air brakes, automobile tire rims and cigar banding machines, and with auxiliary works structures, will give employment to about 300 men. The company has a site of about 8 acres of land at the terminus of the Wilkens Avenue carline and plans for a total plant investment of about \$168,000.

Otteneheimer Brothers, Baltimore, manufacturers of refrigerators, ice machinery, etc., will remodel the former plant of the Montford Iron Works at a cost estimated at \$100,000. The company will largely increase its present output, giving employment to about 150 persons at the new location.

J. F. Henry, 820 Eighth Avenue, Wilmington, Del., is

planning for the erection of a one-story foundry, 40 x 80 ft., on Eighth Avenue.

The American Straw Board Co., Chestertown, Md., is considering the rebuilding of its plant, destroyed by fire Aug. 17, with loss of about \$200,000.

The duPont Motor Mfg. Co., 904 Market Street, Wilmington, Del., has commenced the erection of a machine shop, 60 x 250 ft. on Commerce Street, to form the first building of its proposed plant at this location for the manufacture of automobiles. A number of other structures will be erected at an early date. It is proposed to inaugurate active operations within about a month, allowing for the completion of cars early in November. The works will specialize in runabouts, and 4 and 5-passenger car models, with machines weighing about 3150 lb. E. Paul duPont is president, and John A. Pierson, chief engineer.

The Southern Spring Bed Co., Atlanta, Ga., is planning to rebuild its plant, recently destroyed by fire. The new works are estimated to cost about \$75,000.

The Thompson Voting Machine Co., Washington, D. C., has been incorporated with a capital stock of \$100,000 by Charles F. and Marshall F. Thompson, and C. E. George, to manufacture voting machines.

The Common Council, Sumter, S. C., is planning for extensions and improvements in the municipal electric light and power plant to cost about \$85,000. The work will include a new generating unit of 1000 kw. capacity, surface condenser, and auxiliary equipment, with new boiler, boiler-feed pumps and other apparatus.

Chicago

CHICAGO, Aug. 25.

Business continues to develop at a good rate, although most individual orders are small. Among the largest of recent orders was one received by a local dealer from the Sundstrand Adding Machine Co., Rockford, Ill., covering about \$50,000 worth of miscellaneous equipment, including engine and bench lathes, drill presses, grinding machines, punch presses and riveting machines. Another Chicago seller booked a \$40,000 order for 11 Lees-Bradner gear hobbors, and in addition sold two 32 in. x 32 in. x 10 ft. motor-drive planers. A Milwaukee company has purchased four automatic screw machines, and the Ingersoll Milling Machine Co., Rockford, Ill., has bought a number of engine lathes and a horizontal boring machine. The Barber-Colman Co., Rockford, has closed for two planers, but is still in the market for an additional planer and a boring mill. The Gardner Machine Co., Beloit, Wis., is inquiring for a radial drill and an engine lathe.

Deliveries are steadily becoming a more serious problem. Competition with Government tools is beginning to be felt, but it is a future contingency rather than a present factor in the market. Those who have visited the storage depot in the old Symington plant here estimate that from \$20,000,000 to \$30,000,000 worth of equipment has been assembled there, of which close to 60 per cent consists of single-purpose war machines, which will have to be scrapped or held for future emergencies. Owing to the building trades lock-out the roof of a part of the depot has not been completed, with the result that nearly half of the tools stored there are exposed to the elements. The Belgian commission, which visited the depot recently, as announced in this column a week ago, has an extensive itinerary, including Pittsburgh, Cincinnati, Detroit, Cleveland, Buffalo, Rochester, Utica, Schenectady, Worcester, Boston, Providence, New Haven, Portland, Waterbury, Bridgeport, Philadelphia, New York, and Baltimore. At the conclusion of their trip, the Belgians will go to Washington to conclude the purchase of the equipment they desire.

The Federal Electric Co., manufacturer of electrical equipment, Lake and Des Plaines streets, Chicago, has purchased property at the corner of State and Eighty-seventh streets, where it will erect a new plant.

The Walker Vehicle Co., manufacturer of electric vehicles, Wabash Avenue and Thirty-ninth Street, Chicago, has bought a tract at State and Eighty-seventh streets as the site for a new plant.

The Belden Mfg. Co., manufacturer of insulated wires, 2300 South Western Avenue, Chicago, has awarded a contract for the construction of a four-story factory, 90 x 114 ft., at 4621-4629 West Van Buren Street. The estimated cost is \$100,000.

The Westerlin & Campbell Co., manufacturer of ice-making machinery, 26 North Clinton Street, Chicago, is receiving bids on a one and two-story factory, 50 and 75 ft. x 125 ft., to be erected on Newport and Cornelia avenues, to cost \$50,000.

Roy S. Moline, 7622 Ingleside Avenue, Chicago, has

awarded contracts for the erection of a one-story machine shop, 50 x 50 ft., at 7936-7938 South Chicago Avenue, at a cost of \$5,000.

The Knight Light & Soda Fountain Co., 341-351 West Chicago Avenue, Chicago, expects to award contracts this week for a three-story plant, 198 x 210 ft., and a one-story building, 163 x 198 ft., at the northeast corner of North Kildare and Schubert avenues, to cost \$200,000.

Bids are being taken on a one and two-story garage, 103 x 161 ft., to be erected at 4820 Cottage Grove Avenue, Chicago, for Mandel Brothers, at an estimated cost of \$50,000.

The Kissel Motor Car Co., Harry P. Branstetter, agent, 50 East Twenty-sixth Street, Chicago, is having plans drawn for a three-story service station, 100 x 103 ft., to be constructed on Michigan Avenue near Twenty-sixth Street, at a cost of \$70,000.

The Hy-Speed Wrench Co., 139 North Clark Street, Chicago, has been incorporated with \$40,000 capital stock by Israel Lipman, Ray Rhyman and William Frankel.

The Gillette Storage Battery Co., 2315 Indiana Avenue, Chicago, has been chartered with \$11,000 capital stock by Samuel Hyman, Simon and J. Louis Sleps.

The Rock River Tool Co., Rockford, Ill., has been incorporated with \$10,000 capital stock to manufacture metal-working tools. The incorporators include F. W. Troggle, John Jensen and M. B. Trostle of that city.

The Moline Iron Works, Moline, Ill., will erect a foundry to cost \$250,000.

The Comet Automobile Co., Decatur, Ill., has let a contract for a power plant to cost \$22,000.

The Meadows Mfg. Co., manufacturer of agricultural implements, Pontiac, Ill., will remove its plant to Bloomington, where it has secured a site and will erect two buildings, 80 x 300 ft. and 80 x 400 ft. respectively, as well as a foundry, pattern shop, offices, etc.

The Royal Supply Co., manufacturer of canning machinery, Cincinnati, will move its plant to East St. Louis, Ill.

The Vincennes Auto Radiator Co., Vincennes, Ind., has been incorporated with \$2,000 capital stock to manufacture, repair and rebuild automobile radiators. The directors include Leo E. Beck, William H. Duchane and John N. Fitzgerald.

The Anderson Foundry & Machine Works, Anderson, Ind., has completed plans for the construction of two additions, 80 x 100 ft. and 80 x 150 ft., to cost \$125,000.

The Stutz Motor Car Co. of America, Indianapolis, Ind., will soon commence the construction of additional buildings which, with equipment, will cost approximately \$800,000.

The Northern Wheel Co., Alma, Mich., a recently organized corporation, will soon break ground for the first unit of its plant to be used for the manufacture of wheels for automotive vehicles. The building will be 60 x 300 ft.

The Fields Mfg. Co., manufacturer of motor truck bodies, Owosso, Mich., has begun work on an addition that will double its capacity, adding 600,000 sq. ft. of floor space to its present plant.

The Barsness Mfg. Co., Black Earth, Wis., manufacturer of lever cattle stanchions, recently opened a new factory.

Joseph J. Kovar, Owatonna, Minn., manufacturer of harrows, has let a contract for a two-story and basement plant, 70 x 103 ft., to cost \$35,000.

William Aab, New Ulm, Minn., will erect a plant, 20 x 40 ft., for the manufacture of a patented device for reboring automobile cylinders.

The Bemidji Machine Works, Bemidji, Minn., will be enlarged.

The Voss Brothers Mfg. Co., Davenport, Iowa, manufacturer of washing machines, will construct a four-story plant, 75 x 150 ft. It has increased its capital stock over \$100,000.

The Cushman Auto Tool Co., Champaign, Ill., has purchased the entire equipment and business of the D. F. Boyer Handle Co. and the Danville Handle Co., Danville, which it will operate as a branch plant, manufacturing a full line of handles.

The Pioneer Pole & Shaft Co., Piqua, Ohio, is having plans prepared for the construction of an addition to its plant at Cairo, Ill., to cost about \$70,000.

The Eagle Foundry, University and Twenty-sixth avenues, Minneapolis, Minn., was partially destroyed by fire, Aug. 15, with loss estimated at \$25,000. It is operated by the J. W. Bryant Co., which plans to rebuild.

Property of Werner & Pfleiderer Co., Saginaw, Mich., manufacturer of bakers' machinery, conveyors, hydraulic presses, etc., will be sold by Francis P. Garvin, Alien Property Custodian, on Sept. 12.

Pittsburgh

PITTSBURGH, Aug. 25.

The Duff Mfg. Co., Pittsburgh, is constructing an addition, 80 x 160 ft., of brick and steel, following the standard Austin industrial construction. It is designed to accommodate the forge shop and heat treating department. Provision has been made for installing 16 steam hammers, with an equal number of trimming presses. The heat treating department will be equipped with furnaces of the latest type, burning either oil or gas. The completion of the shop, about Oct. 1, will enable the production of Duff jacks to be largely increased.

The Keystone-Buick Co., Pittsburgh, has arranged for a two-story repair shop and automobile service works on Baum Boulevard, near St. Clair Street, to cost about \$46,000.

The Potomac Edison Co., Grafton, W. Va., recently incorporated with a capital of \$4,000,000, to take over a number of electrical properties in this district, including the Hartland Power Co., Hartland, and the Edison Electric Illuminating Co., Cumberland, Md., is planning for a new power plant in the mining section to furnish electric power for coal mines operation.

The West Virginia-Pittsburgh Coal Co., New Cumberland, W. Va., is planning for the immediate erection of a new power plant at its LaBelle mines; the company will also extend its railroad line at the LaBelle, Colliers and Gilchrist mining properties. The work is estimated to cost \$100,000.

The first buildings to form the new plant of the West Virginia Metal Products Co., Fairmount, W. Va., will be one-story, 280 x 360 ft., and 80 x 280 ft., to cost with equipment about \$300,000. Other structures will be erected later, bringing the total plant investment up to about \$1,000,000. The company will specialize in the manufacture of brass and copper products, and the plant will include a brass rolling mill. Dreher, Churchman, Paul & Ford, 1424 Walnut Street, Philadelphia, are the architects. J. E. Watson is president.

The Electric Service Co., Beaver Falls, Pa., manufacturer of electrical equipment and their repair, is removing to new quarters at 700 Third Street, for increased operations. It is increasing its present working force and new shop equipment is being installed. C. J. Freund is president.

The Atco Mfg. Co., Homestead, Pa., has been incorporated with capital stock of \$50,000 by George B. Atwater and Adam C. Cochran, Homestead; and Adolph Stark, McKeesport, Pa., to manufacture machinery and parts.

The California Avenue Garage Co., Pittsburgh, has filed plans for a one-story reinforced-concrete and brick repair shop and automobile service works at California Avenue and Chellis Street, to cost about \$25,000.

The Pennsylvania Toy & Novelty Mfg. Corporation, Pittsburgh, has been incorporated with a capital stock of \$100,000 by Horace A. and M. B. Yost, and Malcolm MacDonald to manufacture mechanical tops and metal specialties.

The West Virginia Metallic Tie Co., Clarksburg, W. Va., has been incorporated with a capital of \$25,000 by Samuel Morano and associates, to manufacture metal railroad ties.

The coal tippie of the Ephraim Creek Coal Co., Ephraim, W. Va., which was destroyed by fire, Aug. 15, with loss of about \$25,000, will be rebuilt.

Indianapolis

INDIANAPOLIS, Aug. 25.

Chicago and New York capital, represented by William Kahl and Fred A. Caten, Chicago, has purchased the Supertrud Tire Co., South Bend. Mr. Kahl will be vice-president and Mr. Caten secretary-treasurer of the new concern. More factory buildings will be erected, the expansion program involving an expenditure of several million dollars.

The G. & J. Tire Co., Indianapolis, has started work on a five-story reinforced concrete addition, 100 x 400 ft., involving an expenditure of \$1,000,000, and which will more than double the capacity of the plant. W. B. Harding is president. The force will be increased from 1260 to 2500.

The Dunn Motor Co., Indianapolis, has been incorporated with \$50,000 capital stock to manufacture motors and other metal products. The directors are Henry F. Dunn, Benjamin D. Auferderheide and George H. Rossebo.

The Ligonier Auto Body Co., Ligonier, Ind., has been incorporated with \$135,000 capital stock to manufacture automobile bodies and accessories. The directors are Alexander Weiss, Maurice Loeb and Sigmund Loeb.

The American Pozvolana Co., Indianapolis, has been incorporated with \$1,000,000 capital stock to manufacture hollow tile, etc. The directors are John J. Briggs, Alfred E. Rose and J. B. Cockrum.

The Equator Mfg. Co., Indianapolis, has been incorporated with \$20,000 capital stock to manufacture machines, tools and accessories. The directors are R. C. Berry, Lloyd Beckwith, T. H. Endicott, A. T. Potter and M. M. Poole.

Gilmore M. Haynie & Co., Evansville, Ind., has been incorporated with \$20,000 capital stock to manufacture and install motor-driven power and light plants. The directors are Gilmore Haynie, Isidor Kahn and M. S. Haynie.

The Irvin Robbins Co., Indianapolis, will enlarge its plant to provide for a daily capacity of 20 closed automobile bodies. The improvements are to cost \$100,000, including boiler house. The company has increased its capital stock from \$100,000 to \$1,000,000.

Leroy M. Cline and Peter F. Emmert, machinists, Lebanon, Ind., have organized a company to manufacture automobile truck cabs and tops and to do general machine repair work.

The Anderson Foundry & Machine Co., Anderson, Ind., will spend \$100,000 on additions to its plant.

The Continental Auto Parts Co., Newcastle, Ind., has increased its capital stock from \$50,000 to \$100,000.

Milwaukee

MILWAUKEE, Aug. 25.

Although labor troubles in local and outside metal-working industries have been responsible in several instances for delay in purchases of machine tools, business is reported as satisfactory and showing gradual improvement. The milling machine trade continues to occupy a conspicuous position and local builders are keeping well sold up. While the automotive industries are still the largest buyers of milling machines, other shops are entering the market, some of which have not made purchases of this class of equipment since the signing of the armistice.

The Nortmann-Duffke Foundry Co., Milwaukee, has changed its corporate style to Nortmann-Duffke Co., the change being made to indicate the broadened scope of its operations. The company has been operating a metal perforating shop for several years and this department has grown to be relatively as important as its gray iron casting department. Franklin B. Giesler is vice-president, and Louis Duffke, secretary and treasurer.

The Kearney & Trecker Co., Milwaukee, manufacturer of milling machines, is erecting a brick and steel machine shop addition, 40 x 480 ft., to provide much-needed manufacturing space. The plant has been overcrowded with business for many months and most departments have been compelled to operate on a day and night schedule to meet orders. The new facilities will be ready for production in three or four weeks. E. J. Kearney is secretary and treasurer.

The General Tractors, Inc., New York and Chicago, has been incorporated in Delaware with a capital stock of \$1,500,000 as a reorganization and consolidation of the Monarch Tractor Co., Watertown, Wis., Monarch Tractor Co., South Dakota, and Monarch Tractor, Ltd., Brantford, Ont. The main works were established at Watertown about three years ago. Later a Canadian plant was opened at Brantford. In April, this year, the concern acquired the plant and business of the American Standard Products Corporation, Paulsboro, N. J., covering an area of 17 acres. The New Jersey plant is being converted for the production of a new two-wheel garden type tractor and a 9-16 hp. machine. The Watertown plant, manufacturing the heavier types, will increase its capacity from 5 machines a day to 10 by the installation of considerable new machine tool equipment in extensions which have been erected the past year. The Canadian works also will be enlarged to provide additional capacity for the heavier types of machines. W. N. Smith, Watertown, Wis., is president and general manager.

The J. I. Case Plow Works, Racine, Wis., has been incorporated in Delaware with an authorized capital stock of \$5,000,000 first preferred; \$5,000,000 second preferred, and 125,000 shares of common without par value. The new corporation effects the consolidation of the J. I. Case Plow Works and the Wallis Tractor Co., both of Racine, Wis., the ownership and management of which have been largely identical for several years. H. M. Wallis is president and general manager.

The Continental Axle Co., Edgerton, Wis., has been incorporated with a capital stock of \$200,000 to manufacture axles for motor trucks, trailers, tractors, etc. Work began Aug. 20 on the erection of a brick, steel and concrete machine shop, 200 x 300 ft., which is expected to be ready about Oct. 25. The Continental company has purchased the plant, equipment and business of the Higgins Spring & Axle Co., Racine, Wis., and will abandon the Racine shops, moving the equipment and stock to Edgerton. Some new machine tool and other

equipment is being purchased. James W. Menhall, vice-president and general manager Highway Trailer Co., Edgerton, is the moving spirit in the new enterprise.

The Bull Dog Tractor Co., Oshkosh, Wis., has been incorporated with an authorized capital stock of \$750,000 and will establish a machine shop and assembling floor for the production of four-wheel-drive farm and general purpose haulage machines. The incorporators are J. H. Tritz, Eber Simpson and Arthur H. Gruenwald. Several machines have been built for demonstration purposes.

The Milwaukee Concrete Mixer Co., 955 Thirtieth Street, Milwaukee, has let contracts for the construction of an additional story, 35 x 330 ft., to its main shop building. Some new equipment is being purchased. George R. Baumbach is secretary-treasurer.

The Ogren Motor Car Co., Milwaukee, has started work on remodeling a building at 692-698 National Avenue, into a machine shop and assembling room for the production of passenger automobiles. Most of the equipment has been ordered but several items remain to be purchased. Hugh W. Ogren is president and general manager.

The Badger Furnace Co., Appleton, Wis., manufacturer of hot air heating devices, is building a two-story shop addition, 41 x 48 ft.

The Stevenson Mfg. Co., Barton, Washington County, Wis., has broken ground for the first unit of its new steel barn equipment and farm appliance plant, 80 x 138 ft., part two stories. With new equipment the investment will be \$45,000. Charles M. Stevenson is vice-president and chief engineer.

The Milwaukee Automobile Service Co. has been incorporated with a capital stock of \$50,000 to establish a general machine shop which will specialize in making parts for replacement on motor vehicles. The incorporators are Edwin L. Mohr, Richard M. McDonald and E. J. G. Henderson.

The Langstadt & Meyer Co., Appleton, Wis., manufacturer of farm lighting systems and other electrical equipment, will enlarge its plant at 767-771 College Avenue by the erection of a two-story addition costing \$25,000. New tools and other equipment are being purchased. Herman Wildhagen is architect.

R. G. Suettinger, Two Rivers, Wis., manufacturer of blowing systems and general sheet metal products, will purchase additional equipment and enlarge his working force to handle several contracts for equipping new industrial plants in Two Rivers and vicinity.

The Manitowoc Aluminum Specialty Co., Manitowoc, Wis., has opened negotiations with the Chilton Advancement Association, Chilton, Wis., with a view of relocating its plant. Tentative plans call for a three-story factory, 60 x 200 ft., and a steam generating power plant, 30 x 55 ft., estimated to cost \$75,000. Walter Spindler is president and general manager of the Manitowoc concern.

The Wisconsin Textile Mfg. Co., Two Rivers, Wis., manufacturer of metal and wood forms and other specialties for textile mills and factories, will erect a manufacturing addition costing about \$30,000 at Main and Bridge streets. O. B. Alberts is secretary and treasurer.

The Ripon Toy Corporation, Ripon, Wis., started work Aug. 20 on the erection of the first unit of its plant, 60 x 150 ft., two stories and basement. The company is a development of the Kangaroo Co. of Chicago, which has been reorganized with Ripon capital and incorporated for \$150,000 in Wisconsin. It will manufacture electrical and mechanical toys. W. R. Keene, formerly of Chicago, is general manager.

The Slinger Foundry & Machine Co., Portage, Wis., is contemplating the erection of an addition to its machine shop and foundry costing about \$20,000. Work may not be undertaken until after Jan. 1, however. H. W. Slinger is general manager.

The Ramstack & Sons Mfg. Co., Milwaukee, is being organized with a capital stock of \$25,000 to manufacture patented spark plugs and other ignition specialties. Franklin Ramstack, formerly president and treasurer J. E. F. Spark Plug Co., is head of the new concern. The J. E. F. Spark Plug Co. is building a \$50,000 machine shop at Thirty-seventh Street and Hillside Lane. The Ramstack company will continue operations in the present plant at 1826 Brown Street and will soon buy some new tools.

Edward F. Witthuhn, 984 Lake Street, Appleton, Wis., is establishing a machine shop for the manufacture of an electric washing machine. John Heinzen and Fred Miller have become associated with Mr. Witthuhn.

St. Louis

ST. LOUIS, Aug. 26.

The Fort Smith Compress Co., Fort Smith, Ark., J. D. Goldman, St. Louis, president, and Thomas Lally, manager, McAlester, Okla., is in the market for about \$25,000 worth of machinery.

J. F. Rhyne, Delight, Ark., is in the market for electric generating equipment for plants to be installed at Okolona and Delight, Ark.

The Missouri Southwestern Utilities Co., O. P. Moss, manager, Pine Bluff, Ark., will equip a steam plant for the generation of electric current.

The power plant whose equipment will cost about \$115,000 will be installed at New Orleans, La., by the Bureau of Yards and Docks, Navy Department.

The Pelican Well Tool & Supply Co., Shreveport, La., M. G. Stewart president, will equip a plant for the manufacture of oil field equipment. Machine equipment is wanted immediately.

The Duco Adding Machine Co., St. Louis, R. L. Curzon and others interested, will equip a \$100,000 plant for the manufacture of adding machines, etc.

The National Oil & Refining Co., Edward P. Allen, Frank H. Clark and L. R. Hetherington, all of Quincy, Ill., will equip a \$100,000 oil refinery in Oklahoma.

Morris & Co., Chicago, Ill., will equip a refrigerating plant at Helena, Ark., to cost \$150,000.

The Lake Charles Planing Mill Co., Lake Charles, La., Archie Cameron president, is reported in the market for about \$20,000 worth of additional machinery.

The White-Grandin Lumber Co., Lake Charles, La., will equip a \$500,000 saw mill.

The Solid Steel Scissors Co., Fort Smith, Ark., will enlarge the capacity of its plant for the manufacture of scissors and other metal articles.

Vance & Harding, Batesville, Ark., are reported in the market for about \$25,000 worth of machinery for a quarry at Penter's Bluff.

The Stringtown Crushed Rock Co., McAlester, Okla., R. L. Hatfield and others interested, is reported in the market for about \$30,000 worth of rock crushing and handling machinery.

The Edison Electric Equipment Co., Baum Building, Oklahoma City, Okla., is reported in the market for machinery including an engine.

The Wagener Paint & Glass Co., Kansas City, Mo., W. V. Hunn, president, will erect a four-story plant, 113 x 250 ft., at a cost of about \$400,000.

Cincinnati

CINCINNATI, Aug. 25.

There is a falling off in orders for machine tools from England, but France and Belgium are buying steadily. Attention has repeatedly been directed to the large demand for machinery from Spain, although high ocean freight rates are still a retarding factor in securing orders for heavy machines. Quite a number of inquiries for machine tools have been received from Norway and Sweden, but business seems to be somewhat slow in developing. Japan is a steady customer for machine tools.

Domestic business is widely scattered. Automobile manufacturers are still leading in the purchase of all kinds of equipment, and there is also a good demand for medium sized lathes from oil well equipment firms in different parts of the country.

No strikes are in force in this vicinity that would affect the machine-tool trade.

The American Metal Products Co., 1225 Budd Street, Cincinnati, maker of automotive parts and machine screw products, is increasing the capacity of its plant. A. L. Holmes is general manager.

Additions to the plant of the Modern Foundry Co., Oakley, Cincinnati, together with new equipment that will be installed, will more than double its present capacity.

The Moclane Mfg. Co., Hamilton, Ohio, is equipping a plant for the manufacture of household refrigerating machines.

The Carroll Engineering Co., Dayton, Ohio, has secured a large contract for equipment to be installed in a plant at Walkerville, Canada, being built by the General Motors Corporation.

The Timken Roller Bearing Co., whose new plant at Columbus, Ohio, is under construction, has taken over the plant of the Superior Tool & Die Co., Columbus.

The Dayton Engineering Laboratories Co., Dayton, Ohio, is adding equipment to its plant. An extension is also planned.

The Columbus Commercial Body Co., Columbus, Ohio, is adding equipment that includes metal-working machinery for the manufacture of automobile bodies.

The Cummins Machine Co., Minster, Ohio, has increased its capital stock from \$50,000 to \$60,000.

The Ohio Valley Foundry Co., Marietta, Ohio, has been organized by C. Lanam and others, to operate a gray iron foundry.

The Dayton Steel Co., Dayton, Ohio, is making an addition to its fabricating plant.

The Thompson Grinder Co., Springfield, Ohio, has let the contract for a one-story building, 60 x 200 ft., on a three-acre plot, to the Concrete Steel Construction Co., Springfield, at a cost of about \$25,000.

Texas

AUSTIN, Aug. 23.

The Republic Oil & Refining Co., Dallas, has plans for the erection of a 500-bbl. refinery, which it will build in that city. It has a capital of \$2,000,000, and has developed considerable oil lands in the central west Texas fields.

The Beacon Refining Co., Henrietta, will build an oil refinery with a daily capacity of 3000 bbl. George K. Fitch is president; Joseph Edwards, vice-president and general manager; Robert R. Hodge, secretary, and J. E. Dale treasurer. The company will lay pipe lines from the refinery to the Burkburnett and Petrolia fields.

H. K. Neal, Dallas, and associates are organizing the Interstate Airplane Mfg. Co. to manufacture airplanes.

W. W. Dunham, Breckenridge, and associates will build a plant with a daily capacity of 20,000 bricks.

The Gulf Coast Machine & Supply Co., Beaumont, recently incorporated with a capital stock of \$50,000, is planning for the erection of a new machine shop to cost about \$10,000, and the machinery installation about \$30,000. The structure will be 36 x 128 ft., and will specialize in the production of oil-well equipment. C. T. Willis is manager.

The San Antonio Machine Co., San Antonio, is having plans prepared for the construction of a new machine shop to cost about \$25,000, including equipment.

The Eastland Oil & Refining Co., Dallas, Tex., has increased its capital from \$500,000 to \$750,000.

The Elco Pump Co., manufacturer of standard visible measuring devices, Waxahachie, recently incorporated, is erecting a plant to be ready for occupancy Sept. 1. The company is in the market for some machinery, particularly a 24-in. heavy-duty quick change lathe and about a No. 4 universal milling machine. It will require other lighter machinery in addition to that which it already has. T. W. Greer is general manager.

Detroit

DETROIT, Aug. 25.

Statistics prepared by the Machine Tool Division of the War Industries Board and inquiries among machine-tool manufacturers and dealers show that Michigan has only 21 firms engaged in making machine tools and employing 2965 men, while in the United States there are 378 machine tool manufacturers, employing 77,154 men.

The new plant of the American Broach & Machine Co., Ann Arbor, Mich., is nearing completion, and the company expects to take possession by Sept. 1. The building is 40 x 218 ft., and is being equipped with specially built machines. It will employ 100 men to start. Another building, 40 x 175 ft., will be erected in the near future.

The Paige-Detroit Motor Car Co., Detroit, is reported to have arranged for the issuance of \$3,000,000 of additional preferred stock.

The Union Cap Screw Co., Detroit, has purchased the plant of the Motor Products Co., Walkerville, Ont. It will obtain possession Oct. 1, and will employ more than 100 men in its new plant. The Motor Products Co. will move into its new works on Walker Road.

The Hugh Lyons Co., Lansing, Mich., has started construction on an addition to its factory 200 ft. long, two stories, to be used to increase the capacity of the machine and assembly department. Another smaller addition now under way will double the capacity of the sheet metal department. The company makes over 3000 different display fixtures and parts.

The Purdy Boat Co., capitalized at \$75,000, has purchased

a site at Trenton, Mich., on the Detroit River, and will build cruiser boats, similar to those it builds at its yards in Miami Beach, Fla.

The Currier Machine Shop, Yale, Mich., has been sold to Charles E. and William Houser, Port Huron, Mich., who expect to expand the business.

The Maring Wire Corporation, headed by Albert Maring, formerly of the American Enamelled Wire Co., has been organized at Muskegon, Mich., to manufacture a wire which needs no silk or rubber insulation, the enamel covering being sufficient. The company is capitalized at \$50,000.

Announcement is made of a merger between the McCord Mfg. Co. and the Russel Motor Axle Co., Detroit, whereby the former company gains control. The McCord company manufactures automobile radiators and the Russel company internal drive gears and axles for trucks and motor cars.

The Lansing Tool & Stamping Company, Lansing, Mich., announces that it has on hand sufficient contracts to provide for capacity production until Jan. 1, and that in certain lines the output is absorbed until June, 1920. The company produces chiefly internal grinders.

Canada

TORONTO, Aug. 25.

R. Home Smith, 55 Bay Street, Toronto, representative of the Imperial Munitions Board, offers for sale the following equipment: Accumulators, blowers, rock crushers, steam engine, filter; triplex, centrifugal, steam and diaphragm pumps; conveyors, scales, turntables, pipe bends, revolution counters, electric locomotive and charging apparatus, consisting of generator, motor, etc.; batteries, switch-board panels, voltage regulator, flow meter, lighting apparatus, motors, etc., and Durlon castings.

The Cockshutt Flow Co., Brantford, Ont., is preparing to start work on an addition to cost \$100,000.

The Galt Brass Co., Ltd., Galt, Ont., recently incorporated, will build additions and extend the present plant.

The Convertible Tractor Co., St. Paul, Minn., is making preparations for the erection of a plant at Goderich, Ont.

The Electrical Mfg. Co., Vancouver, B. C., has taken out a permit for the erection of a new factory on Granville Island, to cost \$5,000.

The Laval Industrial Co., Montreal, proposes to erect a stamping works at a cost of \$25,000.

The Dominion Cartridge Co., Ltd., Sherbrooke, Que., has awarded the contract for the erection of an addition to its plant to cost \$50,000.

The American Auto Trimming Co., Walkerville, Ont., will erect a five-story addition to its plant at a cost of \$160,000.

The Pacific Coast

SAN FRANCISCO, Aug. 19.

The local machinery market is quiet, although houses with branches in the southern part of the State report that section is buying more freely, one source of demand coming from the oil regions.

Complaint is heard of the methods employed by the Government in selling its standard machine tools in competition with local companies. It is stated that in some cases when Government agents have learned of a prospective sale they send a representative which offers similar machinery at a price which gets the order. This competition has not seemed to affect dealers in smaller machines as it has some others.

Purchase of a site and preparation of plans for the immediate erection of a factory in Oakland has been announced by the Scripps-Booth Co. of California, Pacific Coast division of the Scripps-Booth Motor Car Co., Detroit.

The Rudgear Merle Co., San Francisco, is planning to erect a new building on the site of its present factory, for increasing the manufacture of iron, bronze and brass bank fixtures, etc.

The Honolulu Iron Co., Honolulu, is planning to erect a foundry and manufacturing plant in Manila to make sugar mill machinery, which will employ from 700 to 1000.

Munro & Morrison, Vancouver, B. C., will erect a saw-mill near Kelly Lake, which will have a daily capacity of 60,000 ft. It will be electrically operated in part.

The N. & S. Foundry Co., Seattle, will erect a one-story addition, 60 x 90 ft.

Cramer & Sons, 4414 Twelfth Avenue, N. E., Seattle, will erect a machine shop and garage to cost about \$10,000.

W. B. Erskine, Seattle, will erect a machine shop at 1513 Eighth Avenue, to cost \$5,000, exclusive of equipment.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

Iron and Soft Steel Bars and Shapes

Per lb.

Bars:	
Refined iron, base price.....	3.37c. to 3.62c.
Burden's H. B. & S. bar iron, base price.....	6.10c.
Burden's best bar iron, base price.....	6.30c.
Swedish bars, base price.....	20.00c.
Soft Steel:	
¾ to 1½ in., round and square.....	3.37c.
1 to 6 in. x ¾ to 1 in.....	3.37c.
1 to 6 in. x ¾ to 5/16.....	3.47c.
Rods—¾ and 11/16.....	3.42c.
Bands—1½ to 6 x 3/16 to No. 8.....	4.07c.
Shapes:	
Beams and channels—3 to 15 in.....	3.47c.
Angles:	
3 in. x ¾ in. and larger.....	3.47c.
3 in. x 3/16 in. and ½ in.....	3.72c.
1½ to 2½ in. x ¾ in.....	3.52c.
1½ x 2½ in. x 3/16 in. and thicker.....	3.47c.
1 to 1½ in. x 3/16 in.....	3.52c.
1 to 1½ in. x ½ in.....	3.57c.
¾ x ¾ x ½ in.....	3.62c.
¾ x ¾ in.....	3.67c.
¾ x ¾ in.....	4.07c.
½ x 3/32 in.....	5.17c.
Tees:	
1 x ¾ in.....	3.87c.
1½ in. x 1½ x 3/16 in.....	3.77c.
1½ to 2½ x ¾ in.....	3.57c.
1½ to 2½ x 3/16 in.....	3.57c.
3 in. and larger.....	3.52c.

Merchant Steel

Per lb.

Tire, 1½ x ½ in. and larger.....	3.37c.
Toe calk, ½ x ¾ in. and larger.....	4.25c.
Open-hearth spring steel.....	6.00c.
Standard cast steel, base price.....	14.00c.
Extra cast steel.....	18.00 to 20.00c.
Special cast steel.....	23.00 to 25.00c.

Tank Plates—Steel

Per lb.

¾ in. and heavier.....	3.67c. to 3.92c.
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Sheets

Blue Annealed

Per lb.

No. 8 and 3/16 in.....	4.52c.
No. 10.....	4.57c.
No. 12.....	4.62c.
No. 14.....	4.67c.
No. 16.....	4.77c.

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20.....	5.30c. to 5.55c.	—
Nos. 22 and 24.....	5.35c. to 5.60c.	6.55c.
No. 26.....	5.40c. to 5.65c.	6.60c.
No. 28.....	5.50c. to 5.75c.	6.75c.
No. 30.....	6.00c. to 6.25c.	—
No. 28, 36 in. wide, 10c. higher.	—	—
Wood's Keystone Hammered, 18-24 gage, 9¾c.; 26-28 gage, 10¼c.	—	—

Galvanized

Per lb.

No. 14.....	5.85c. to 6.10c.
No. 16.....	6.00c. to 6.25c.
Nos. 18 and 20.....	6.15c. to 6.40c.
Nos. 22 and 24.....	6.30c. to 6.55c.
No. 26.....	6.45c. to 6.70c.
No. 27.....	6.70c. to 6.95c.
No. 28.....	6.75c. to 7.00c.
No. 30.....	7.25c. to 7.50c.
No. 28, 36 in. wide, 20c. higher.	—

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSE

Per lb.

Bright basic.....	5.25c.
Annealed soft.....	5.25c.
Galvanized annealed.....	6.00c.
Coppered basic.....	6.00c.
Tinned soft bessemer.....	7.25c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High Brass Sheet.....	32c.
High Brass Wire.....	32c.
Brass Rod.....	31c.
Brass Tube.....	46½c.

Copper Sheets

Sheet copper, hot rolled, 16 oz., 32½c. to 35c. per lb. base.
Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.

Tin Plates

Bright Tin

Grade "AAA"

Charcoal

14x20

Grade "A"

Charcoal

14x20

Coke—14x20

Primes Wasters

80 lb. ..	\$7.80	\$7.55
90 lb. ..	7.90	7.65
100 lb. ..	8.00	7.75
IC ..	8.15	7.90
IX ..	9.15	8.90
IXX ..	10.15	9.90
IXXX ..	11.15	10.90
IXXXX ..	12.15	11.90

Terne Plates

8-lb. Coating 14x20

100 lb.	\$8.50
IC	8.65
IX	9.65
Fire door stock.....	11.75

Tin

Straits pig.....	72c. to 74c.
Bar.....	80c. to 85c.
American pig, 99 per cent.....	70c. to 72c.

Copper

Lake Ingot.....	26c.
Electrolytic.....	24c. to 25c.
Casting.....	24c. to 25c.

Spelter and Sheet Zinc

Western spelter.....8¾c. to 9c.
Sheet zinc, No. 9 base, casks.....12c.; open 12½c.

Lead and Solder*

American pig lead.....	6½c. to 7c.
Bar lead.....	7½c. to 8½c.
Solder ½ and ½ guaranteed.....	45c.
No. 1 solder.....	40c.
Refined solder.....	34c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.....	90c.
Commercial grade, per lb.....	50c.

Antimony

Asiatic.....	9c. to 10c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb....35c. to 37c.

Old Metals

The market is lower. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible.....	17.00
Copper, heavy and wire.....	16.00
Copper, light and bottoms.....	14.00
Brass, heavy.....	10.50
Brass, light.....	7.50
Heavy machine composition.....	15.50
No. 1 yellow rod brass turnings.....	10.00
No. 1 red brass or composition turnings.....	11.50
Lead, heavy.....	4.75
Lead, tea.....	3.75
Zinc.....	5.00

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\$7.55
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7.75
7.90
8.90
9.90
10.90
11.90

\$8.50
8.65
9.65
11.75

74c.
85c.
72c.

26c.
25c.
25c.

to 9c.
2½c.

7c.
8½c.
.45c.
.40c.
.34c.

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.90c.
.50c.

10c.

37c.

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Cents
Per lb.
17.00
16.00
14.00
10.50
7.50
15.50
10.00
11.50
4.75
3.75
5.00